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SUPERCRITICAL PRESSURES TO 800 POUNDS  
PER SQUARE INCH ABSOLUTE

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Cleveland, Ohio

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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SUMMARY

Heat transfer to cryogenic para-hydrogen was experimentally determined in electrically heated vertical tubes. The investigation covered subcritical and supercritical pressures from 80 to 800 pounds per square inch absolute, mass fluxes from 100 to 1000 pounds per square foot per second, and heat fluxes to 3 Btu per square inch per second. The data were accumulated for a variety of tube test sections ranging from 0.188 to 0.507 inch inside diameter with a heated length from 16 to 24 inches. Similarities in the behavior of the near-critical to two-phase data were noted, including a minimum in the heat-transfer coefficient near the saturation or transposed critical temperature (temperature corresponding to a maximum in the specific heat). Flow oscillations were noted primarily when inlet conditions were below the transposed critical (or saturation) temperature. Preliminary results are also presented for a test section with axial heat-flux gradients.

Techniques for correlating Nusselt numbers are discussed. The correlations show promise for states where the hydrogen bulk temperatures are above the transposed critical temperature, although suppression of important parameters in the correlations can sometimes lead to large errors in calculating the basic parameters such as heat flux and wall temperature. Extensive tables of the experimental heat-transfer data are included to aid rocket-cooling-passage designers.

INTRODUCTION

Hydrogen, because of its high specific impulse, is designated as a propellant for advanced chemical and nuclear propulsion systems. Its thermal properties also make it an attractive regenerative coolant for these systems. As a coolant, hydrogen in its para state will be introduced into the cooling passages at a fluid temperature near the critical value and at pressures either above or below the critical value. It is well known that the properties of any fluid in this near-critical state vary appreciably; for this reason it is difficult to

correlate forced-convection heat-transfer data. Indeed, literature can be cited (refs. 1 to 8) to show opposed results: the heat-transfer coefficient of a fluid near its critical point is a maximum in some cases and a minimum in others. In a highly controlled, heated-tube experiment reported in reference 9, this contradiction was clarified by demonstrating that a minimum and a maximum in the heat-transfer coefficient could occur within a very short axial distance of one another.

The phenomenon was apparently associated with the proximity of the fluid to its critical temperature and was not significantly related to the wall temperature or heat-flux distribution. It should be noted, however, that the heat fluxes and temperature differences investigated in reference 9 were very low compared with those associated with a rocket engine.

Reported herein are convective heat-transfer data taken in electrically heated, vertical tubes for para-hydrogen at near-critical temperatures and pressures above and below the critical pressure. Experimental conditions were those generally applicable to design situations in propulsion systems. Some data for the gaseous region far removed from the critical temperature are included for comparative purposes. The range of experimental conditions is given in table I.

To aid in comparing the fluid regimes, the critical properties of hydrogen are (from ref. 10)

Critical pressure, 187.7 psia  
 Critical temperature, 59.37° R  
 Critical density, 1.921 lb mass/cu ft

This report cannot claim the presentation of a theory or correlation that completely resolves the problem of prediction of heat transfer for para-hydrogen at its near-critical state. Nevertheless, within the scope of the experimental investigation, the following results are contributed herein:

- (1) A large quantity of convective heat-transfer data from uniformly heated tubes is presented in tabular and graphical form that can be used in design analysis.
- (2) Some of the trends in the data are discussed, especially those associ-

TABLE I. - EXPERIMENTAL CONDITIONS

Fluid state	Inlet temperature, °R	Inlet pressure, psia	Flow rate, Area	Heat flux, Btu	Wall- to bulk- temperature ratios
			lb (sq ft)(sec)	(sq in)(sec)	
Liquid	45 to 60	220 to 820	60 to 1050	0.3 to 3.3	2½ to 13
Fluid	> 60	220 to 800	50 to 840	0.4 to 3	2 to 8
Liquid	< 60	80 to 180	70 to 700	0.25 to 1.3	4 to 15
Gas	~500	220 to 600	30 to 200	0.2 to 2.7	1.1 to 1.8



ated with fluid properties near the critical point.

(3) A comparison is made of the convective heat-transfer results for the subcritical- and supercritical-pressure regimes.

(4) Preliminary observations are made of the effects of axial-wall heat-flux gradient on heat-transfer coefficients.

(5) Several heat-transfer correlation techniques, which have limited application to the data, are discussed, and the limitations of these correlations are pointed out. In particular, the extension of a two-phase correlation concept to the supercritical state is discussed.

(6) A correlation is presented for subcritical film-boiling heat-transfer data for the pressure domain of 25 to 175 pounds per square inch absolute.

The definitions for the symbols used in the calculations are given in appendix A, and the computational procedure is given in appendix B. To aid the reader in both visualizing the near-critical property changes and the performance of manual calculations, a set of para-hydrogen property charts is included in appendix C. A detailed discussion of the accuracy of the experimental data is presented in appendix D. A list of symbols with descriptions, dimensions and a guide to the use of the data tables is included in appendix E. The experimental hydrogen heat-transfer data obtained in this investigation, including both measured variables and calculated parameters, are presented in tabular form in appendix F.

## APPARATUS

The test installation is shown schematically in figure 1. The principal components are a mobile low-pressure hydrogen storage Dewar, a high-pressure hydrogen tank, vacuum-jacketed transfer piping, an electrical power supply, and the test section with its associated piping. Low-pressure hydrogen gas pressurization was employed in transferring the liquid hydrogen from the storage Dewar to the high-pressure tank. During the test runs, high-pressure normal-hydrogen gas expelled the hydrogen from the tank into the test section and its associated piping.

### Flow System

The high-pressure tank consisted of a 14-cubic-foot vacuum-jacketed pressure vessel surrounded by a liquid-nitrogen radiation shield, all contained within a foam-insulated tank. The hydrogen was admitted into the flow system through a dip tube installed in the high-pressure tank. This dip tube included two venturi flowmeters; one was used for recording flow rates and the other was part of a flow-control loop. The flow-control valve, located immediately downstream of the dip tube was hydraulically actuated and integrated with an electronic flow-control loop. The loop enabled the signal from the transducer across the venturi to be matched with a preset signal representing a desired flow rate.

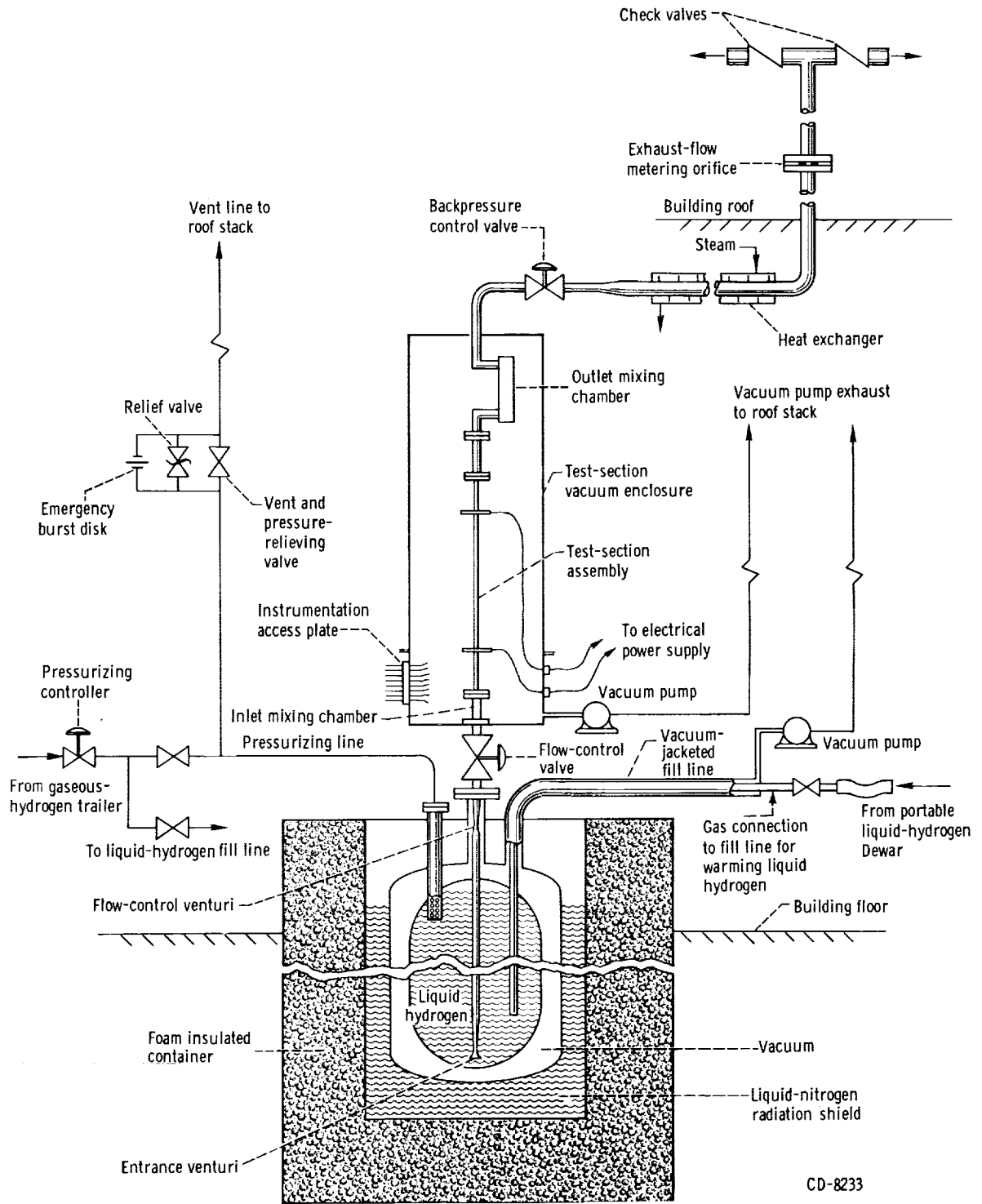


Figure 1. - Schematic diagram of high-pressure liquid-hydrogen heat-transfer apparatus.

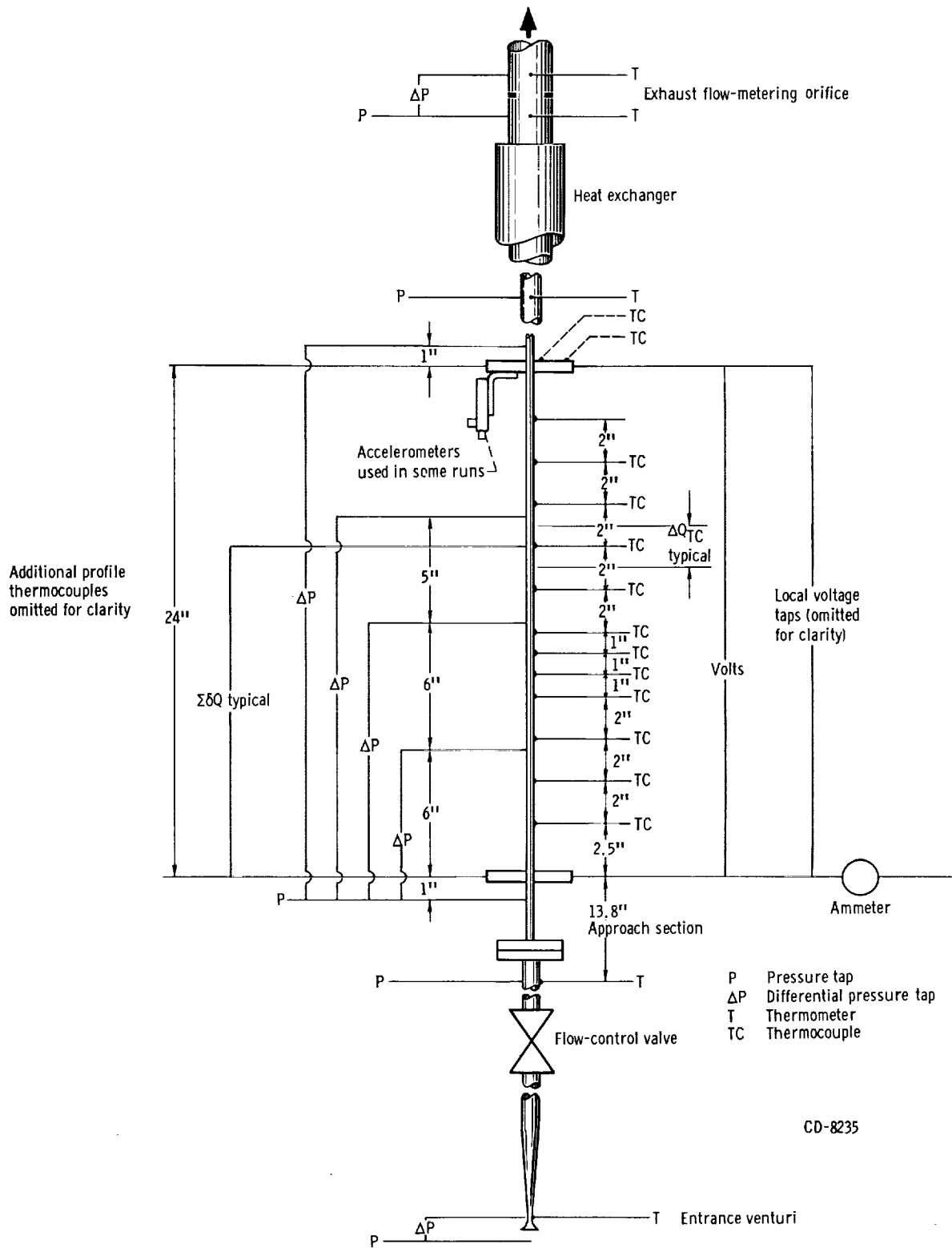


Figure 2. - Schematic drawing of instrumentation (all dimensions are nominal).

The flow from the valve discharged into a mixing chamber where inlet bulk parameters were measured. This mixing chamber served as the entrance to the electrically heated test section. Another mixing chamber served as the discharge from the test section and the same bulk parameters were measured therein. Thereafter, the hydrogen passed through a downstream control valve (used primarily for pressure control) and into a steam heat-exchanger where the hydrogen was completely gasified. Before discharging the gas through a roof vent, the flow was again measured by a sharp-edged orifice.

All elements of the flow system and the vent stacks were grounded to prevent buildup and discharge of static electrical charge.

### Test Section

A schematic drawing of the vertical heat-transfer test section is shown in figure 2. Each test section was instrumented for local temperature, pressure, and voltage measurements. The test section was enclosed in a vacuum environment to minimize heat losses or gains and was electrically isolated from adjacent piping (fig. 1). All but one test section produced essentially uniform heat flux from end to end because of the small change in local resistivity. One test section was built with a tapered wall to produce axial gradients in heat flux that simulated more closely conditions in the rocket-engine cooling channel. The test sections utilized in this investigation are given in table II.

### Electrical Power Supplies

Two different electrical power supplies were employed in this test program. The principal one was a rectified direct-current supply rated at 150 kilowatts at 40 volts output. It turned out that the rectified waveform was very poor, making precise measurement of the electrical power output impossible with conventional direct-current meters. Special meters that properly averaged the waveform were employed. For some runs the rectifiers were bypassed, and the supply was operated as an alternating-current device. The second power supply

TABLE II. - TESTS SECTIONS USED IN INVESTIGATION

Test section	Tube material	Outside diameter, in.	Inside diameter, in.	Heated length, in.	Unheated length, in.	Heated length, L/d	Unheated entrance length, L/d
1	Inconel X	0.527	0.507	24	12	47	24
2	Inconel	.502	.438	24	12	55	27
3	304 Stainless steel	.375	.335	24	12	71	36
4	Inconel	.251	.22	18	12	82	55
5	Inconel	.25	.188	24	12	127	64
6	304 Stainless steel	<sup>a</sup> Variable	.26	16	6.5	61	25

<sup>a</sup>Axial gradient in heat flux affected by variable wall thickness.

was a 65 kilovolt-ampere alternating-current power supply rated at 13 volts maximum output. The different outputs of these two power supplies provided some flexibility in the selection of the test sections and their inherent resistances.

### Instrumentation

The exact axial location of the surface thermocouples on the test section can be obtained from the tabulation of data in tables IV to VII in appendix F (table III is a directory for table IV). The character EL is the axial distance in inches from the inlet heating flange. An additional number of surface temperatures were recorded for checking purposes, such as evaluating circumferential uniformity of heat flux.

The thermocouples were Chromel-Alumel or copper-constantan "spotted" directly or cemented to the test section, as illustrated in figure 3. The spotted thermocouples (fig. 3(b)) were specially made, flattened and alined (with a microscope) in a plane normal to the tube centerline. This meticulous mounting procedure minimized test-section voltage pickup on the thermocouple recording system. These couples were silver-soldered (copper-constantan) or welded (Chromel-Alumel) to the test section. The spotted thermocouples on the outside wall responded well to inside-surface-temperature fluctuations for the thin-wall test section (test section 1 of table IV), but the tubes with heavier walls damped the effect of inside-wall-temperature fluctuations on the sensing thermocouples. It should also be pointed out that the soldering procedure and soldering material in the vicinity of the couples would effect a change in the local curvature and thermal conductivity of the tube wall. These effects were assumed to be small because particular care was exercised in minimizing the amount of solder used and in applying heat uniformly. Comparative checks with insulated and brazed couples on the uniformly heated test section did not indicate a serious error; however, such checks were not made on the variable-wall (test section 6 of table IV) test section. Neglecting any radial variation in thermal conductivity will have little effect on the calculation of the inside-wall temperature provided that the tube wall is thin relative to the radius, but this could introduce a serious error for heavy-wall tubes.

The cemented-type couple (fig. 3(c)) was flattened, smoothed, and contoured to the test section. A thin layer of ceramic cement was painted on the test section and allowed to dry. The junction was set in ceramic cement, wrapped with glass tape, and clamped in place. Tests indicated that properly installed couples read accurately at higher temperatures but failed to respond as rapidly as the spotted thermocouples below liquid-nitrogen temperature ( $139^{\circ}$  R).

The thermocouple wire used for most test sections was 30 gage (0.010 in.). For most of the runs, a melting-ice reference junction was employed, but for some low-temperature runs, an atmospheric boiling-nitrogen cold junction was used. As shown in figure 2 (p. 5), several thermocouples were mounted on the electrical bus flanges for assessment of the conduction end losses.

The technique for mounting the pressure taps is shown in figure 3(a).

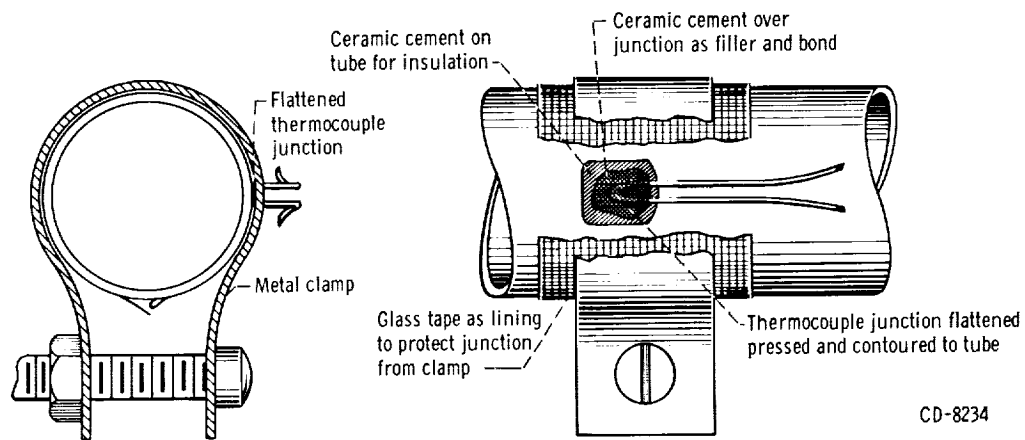
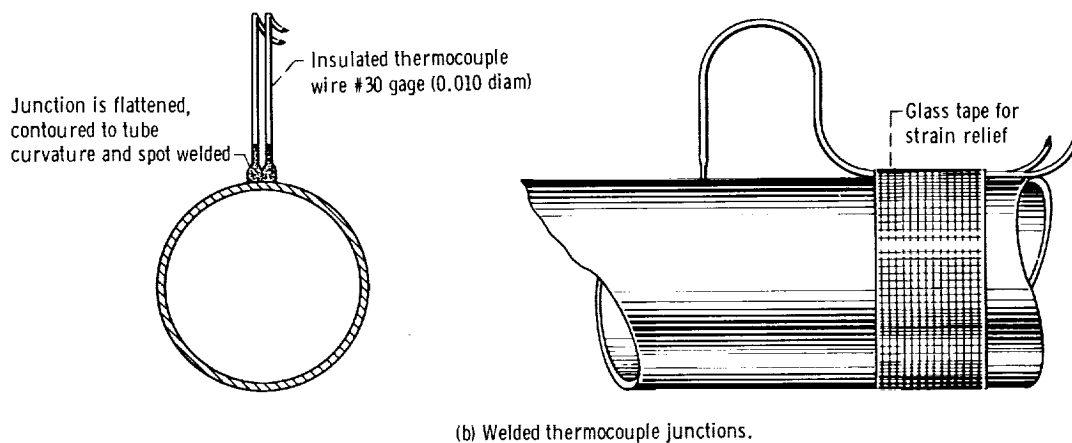
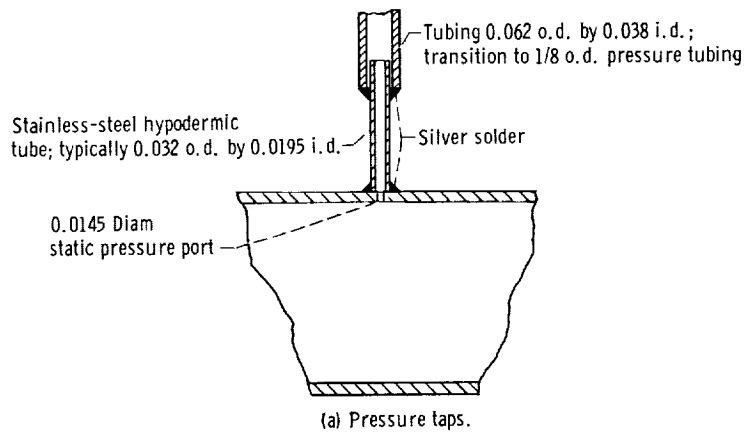


Figure 3. - Enlarged details of instrumentation.

First, a hypodermic tube was silver-soldered to the test section, and the test-section wall was drilled by using the hypodermic tubing as a guide. Next, larger diameter tubing was slipped over the exposed hypodermic tubing and silver soldered. This larger tubing served as a convenient transition to the 1/8-inch outside-diameter tube connections into the pressure transducers. This design produced a desirably small, local pressure tap (approximately 0.015 in.) and a high response system.

Local values of electrical power dissipation were obtained from voltage leads spotted along the tube (fig. 2). These local values compared favorably with those calculated by using tube resistance data (appendix B) and when integrated along the axis of the tube agreed with overall power measurements.

## PROCEDURE

### Operating Conditions

The following ranges of operating conditions were investigated: mass fluxes from 30 to 1000 pounds-mass per second per square foot, inlet pressures from 80 to 800 pounds per square inch absolute, nominal inlet bulk temperatures from 40° to 120° R for liquid and ambient temperature for gas runs, nominal electrical power input from 10 to 65 Btu per second, and nominal wall to bulk temperature ratios to 15.

The higher bulk temperature conditions (>55° R) were obtained by passing normal gaseous hydrogen through the tank of liquid hydrogen at the desired pressure level prior to any run (see fig. 1, p. 4 for gaseous connection). The tank liquid-level thermometers indicated rapid uniform mixing of the para-hydrogen and normal hydrogen resulting in a fluid of unknown composition. This point will be discussed later under the possible error source in item (4), Off-para composition (see p. 10). The gaseous data were run to check out the experimental system, and selected data are included herein for comparison purposes.

### Data Recording

During a run, the local surface temperatures, pressures (static and differential), and fluid temperatures were recorded on magnetic tape by an automatic voltage digitizing system (ref. 11), and were available for write-back on an electric typewriter. The electrical power inputs were recorded manually and monitored by the digitizer and oscillograph recordings. Checks of the digitized data were made on conventional self-balancing potentiometers and on a multi-channel oscillograph.

### Source of Errors

A full discussion of the accuracy of the data is presented in appendix D. It is worth noting here the effects of the power-supply waveform on the data accuracy and the sources of discrepancies in the heat balances.

Many difficulties were encountered recording the power input to the test section. Runs with reference numbers lower than XXX-400 (see appendix E) have corrected power  $Q$  (appendix A) values due to pulsating waveforms from the rectified direct-current power supply (150 kW). Subsequent adjustment of the power supply improved the waveform significantly, and installation of dynamic instrument movements gave more satisfactory power measurements. The saturable-reactor control element could still yield a peculiar waveform not amenable to conventional metering. However, the computed heat balance (comparison of electrical input to enthalpy rise in hydrogen) on most runs was within  $\pm 10$  percent indicating that the volt-ampere measurements were accurate.

Some runs, however, have heat balances off by 20 percent or more, yet rejection of these data would not be justified on the basis of heat balance only, as other portions of the data were quite consistent. The conduction and radiation losses were estimated to be of the order of 1.0 percent or less (see appendix B of ref. 12).

Of all the other possible sources of experimental error the authors could advance, only a few appear plausible, namely,

- (1) Surface phenomena (a) para-ortho conversion, and/or (b) surface adsorption of foreign gases that would poison the surface and perhaps alter the surface-to-fluid transport mechanism

The high nickel content in test sections could act as a good catalyst for conversion of para- to ortho-hydrogen. Tests (ref. 12) have indicated this conversion to be small at moderate wall temperatures; however, the effect may not be negligible at high wall temperatures, resulting in erroneous heat balances. At temperatures above  $600^{\circ}$  R, there is little difference in the enthalpy level of para- and ortho-hydrogen, so that the enthalpy at the wall would be uninfluenced by the fluid state. However, conversion at the wall might have a significant effect on the thermal profile in the away-from-wall or wake region of the thermal boundary layer. The presence of the ortho species in these cooler regions could influence the bulk or mixing temperature of the fluid mixture (para plus ortho) and thus affect the heat-balance computations.

- (2) Stratification of fluid in mixing chambers, causing an error in bulk temperature measurement
- (3) Nitrogen in the system that would change the chemical composition of the heat-transfer fluid

There were several experiences where appreciable quantities of nitrogen were evident. This contaminant came from the pressurizing gas equipment. In at least two instances it was present in sufficient concentrations to accumulate solid nitrogen in the venturi of the dip tube and stop the flow.

- (4) Off-para composition due to condensation of the pressurization gas into the cryogenic liquid

For the warm liquid runs, normal hydrogen gas was bubbled through the liquid to



raise its temperature. Condensation<sup>1</sup> of the gas would change the para-ortho composition for these particular runs. For example, to warm 40 pounds of para-hydrogen to 70° R at 300 pounds per square inch absolute, the required heat input becomes

$$40 \text{ pounds} \times \left( H_{70^\circ \text{ R}} - H_{36^\circ \text{ R}} \right)_{P=300 \text{ psia}} = 7376 \text{ Btu}$$

The incoming gas to condense must acquire this energy or

$$\left( H_{\text{ambient}} - H_{70^\circ \text{ R}} \right)_{P=300 \text{ psia}} = 1720 \text{ Btu/lb}$$

Consequently, about 4.3 pounds could condense, resulting in about 9 percent ortho-hydrogen in the fluid mixture. This estimated figure is based on the required change in enthalpy if perfect mixing is assumed. As a check, some data were recalculated by assuming a maximum 10-percent ortho-hydrogen - 90-percent para-hydrogen mixture. The results were not substantially modified; however, some of the heat balances improved. The analysis of the data herein, except gas, assumes 100-percent para-hydrogen conditions.

#### Reduction and Analysis of Data

The symbols used herein are listed in appendix A, and the equations and assumptions employed in reducing the experimental data appear in appendix B.

The thermodynamic and transport data of gaseous and liquid hydrogen used in the supercritical pressure calculations are obtained from subroutine STATE (ref. 13). This program represents a single-source hydrogen-property program highly amenable to heat-transfer and fluid-flow calculations. The calculations in the subcritical pressure regime employ a method analogous to that presented in reference 12 along with some saturation properties and subroutine STATE. Specific heat, viscosity, thermal conductivity, density, and a fluid-properties parameter, computed from reference 12, are presented in plots in appendix C: figure 20 is the interim viscosity computed from reference 14. The newer viscosity data have not been used because of the desirability of having a consistent relation between thermal-conductivity and viscosity data. As new thermal-conductivity data are unavailable, the use of the new viscosity data may introduce erroneous  $\mu$  and  $k$  ratios, as exist for example in the Prandtl number, and thus the figures are included to aid the reader in manual calculations.

#### DATA PRESENTATION

The experimental data and some computed parameters are tabulated in tables IV to VII (appendix F). The hydrogen used in these experiments was greater than 95 percent para-hydrogen except for the gaseous data which were for normal hydrogen. The column headings and notations are explained in appendix E; the calculation procedures are given in appendix B; and a directory to locate runs

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<sup>1</sup>As used here, the cooling of gas to the bulk fluid state.

corresponding to specified test sections and operating conditions (table III) appears in appendix E.

The supercritical-pressure data are segregated into two inlet temperature regimes:  $T_{in} < T_{crit}$  and  $T_{in} > T_{crit}$ . The division of  $T_{in} = T_{crit}$  was taken to assure that the low-temperature regime would be liquid-like. For the low inlet temperature, the data are grouped first with respect to pressure level, then they are ordered with decreasing heat input, and finally, within a group of nearly equal heat inputs, with increasing weight flow.

## DISCUSSION OF DATA

As a result of this experimental program, a number of observations have been made that are relevant to an appreciation of the results. The following subheadings will deal with these observations.

### Similitude Between Two-Phase and Supercritical

#### Fluid-Forced-Convective Results

In reference 15, it was pointed out that an apparent similitude between the two-phase and supercritical forced-convection heat-transfer results existed. Subsequent examination of many of the runs reported herein did verify a similarity in the heated tube results between the two-fluid regimes, as long as the bulk fluid temperature at the tube entrance was less than or equal to the transposed critical temperature for the supercritical-pressure state. (The transposed critical temperature  $T^*$  is the temperature where the value of specific heat maximizes.) The similarity in the character of the data can be observed from an inspection of the temperature profiles shown in figure 4. The solid and dashed curves are axial wall-temperature distributions for a two-phase run and a supercritical run, respectively. The experimental conditions are tabulated in the figure. Note in both cases that the wall temperature increases to a maximum and then falls off. This trend is in contrast to a gaseous hydrogen run, shown as a dot-dash curve, in which the wall temperature increases throughout the length of the tube. Note that the profile for fluid hydrogen, heated well above  $T^*$ , resembles the gaseous profile. Since the two-phase and supercritical runs presented in figure 4 involved a constant heat flux throughout the length of the tube, the heat-transfer-coefficient distributions would be approximately the inverted images of these wall-temperature curves.

Evidence from pool-heating studies of liquid hydrogen (ref. 16) further supports the thesis of a similitude between film boiling and heating of a supercritical fluid. Shadowgraph motion pictures available as a film supplement to reference 16 give a graphic portrayal of this similarity. The associated pool-heating data for both fluid regimes in reference 16 exhibited remarkable similarity even to the extent of near-identical magnitudes. While there are serious limitations to comparing pool-heating with forced-convective-heating experiments, because the latter involves a hydrodynamic component, nevertheless the apparent similarities in the transport mechanisms going on at the wall are

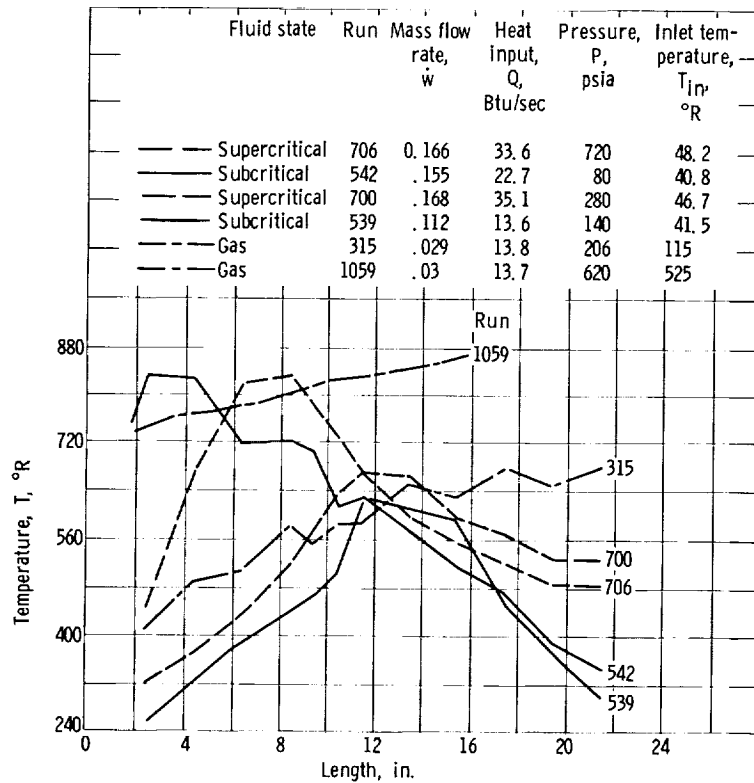


Figure 4. - Surface temperature distribution with axial position for near-critical and gaseous hydrogen. Tube inside diameter, 0.335 inch.

significant, and make their comparison meaningful.

Similar pressure drop and fluid oscillations observed in the heated tube tests for both fluid states also further strengthened the concept of a similarity.

#### Axial Position Of Maximum In Wall Temperature

As discussed in the previous paragraphs, a peak or hump in the tube wall temperature exists for the two-phase and supercritical pressure states. It was further observed from examination of the data that the location of the peak could vary appreciably.

As a first approximation, it was noted that the peak seemed to occur when the computed bulk temperature of the fluid reached the saturation point for subcritical hydrogen or reached the transposed critical point for supercritical hydrogen. Figure 5 depicts some of the bulk conditions associated with the "hump" on the temperature-entropy diagram for inlet conditions below  $T^*$ . Note that many data points fall near the transposed critical-temperature locus (marked  $T^*$ ) but that the scatter is considerable. The nature of the scatter, however, is such that most of the data are within a  $10^{\circ}$  R band, although widely dispersed with respect to enthalpy. For inlet conditions above, but near  $T^*$ ,

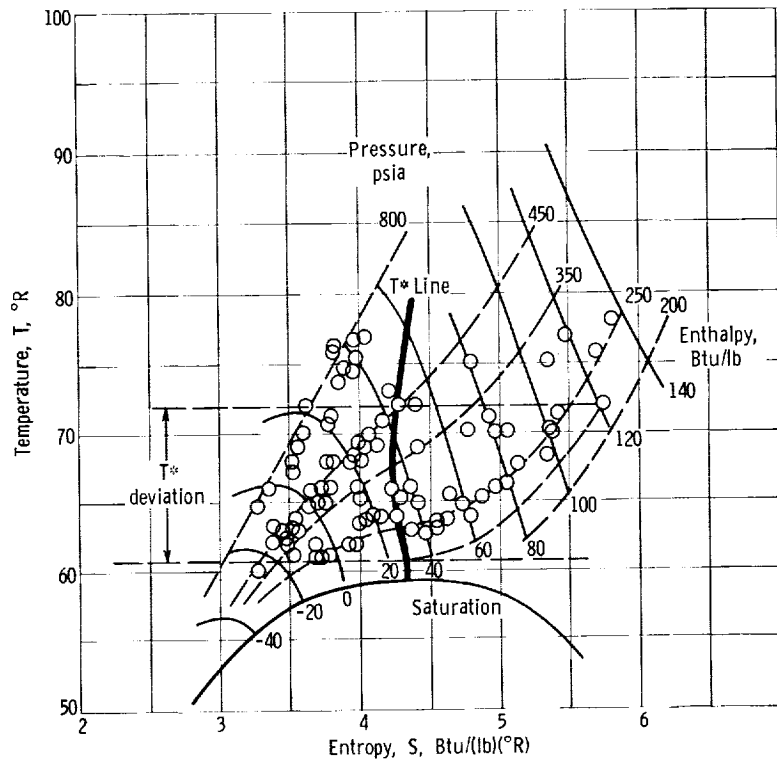


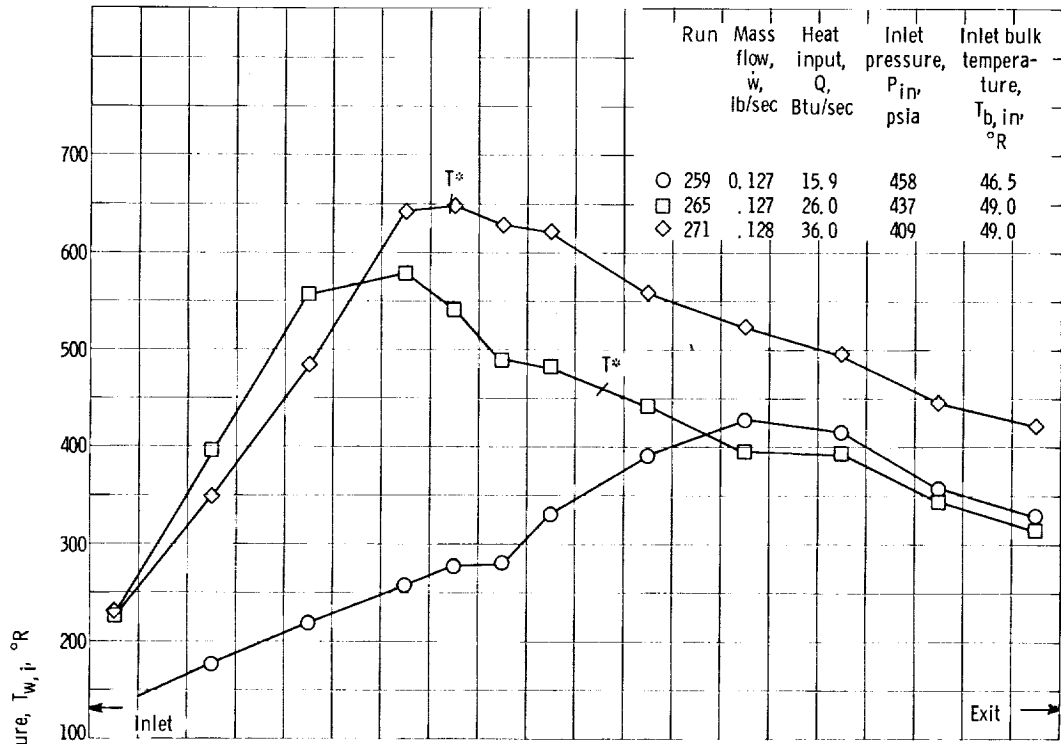
Figure 5. - Location of "hump" in temperature distribution for 0.335-inch inside-diameter test-section data.

the wall-temperature profile either "humped" quite close to the heating flange or assumed the more conventional inlet behavior.

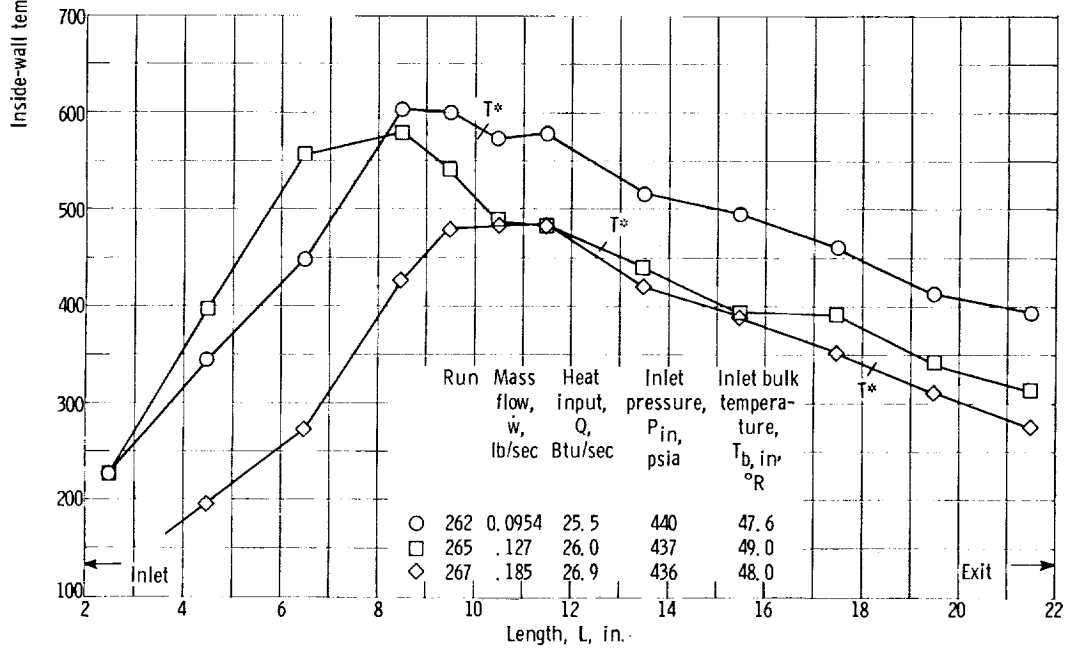
An adequate understanding of the movement of the hump would contribute to an advanced understanding of the heat-transport mechanism in the near-critical state. The experimental data do verify that the position of the hump is sensitive to heat flux, weight flow rate, and the inlet enthalpy conditions, but the functional dependence of these and other parameters is not adequately understood. For example, figure 6(a) illustrates that the hump tends to move upstream as heat flux is increased, although the midrange-heat-flux run shows the hump to be slightly upstream of the high-heat-flux case. Figure 6(b) indicates that increasing the mass flow tends to translate the hump down the tube, but run 265 in this figure also stands out as an exception to the trend.

An investigation was recently reported (ref. 9) where care was exercised in producing an experiment in which changes in the heat transfer could be sensed as the fluid temperature was varied in the vicinity of the critical point and other influences were minimized. The authors of reference 9 concluded that the proximity of the bulk properties to the critical values could be used to correlate the peaks in the heat-transfer coefficient.

This investigation is further complicated by such factors as thermal-layer development, entrance effects, accelerated flow, and a much higher heat-flux magnitude that presumably interact with the fluid-property effects to make the



(a) Effect of heat flux.



(b) Effect of mass flow.

Figure 6. - Inside-wall temperature distributions for 0.335-inch inside-diameter test section.

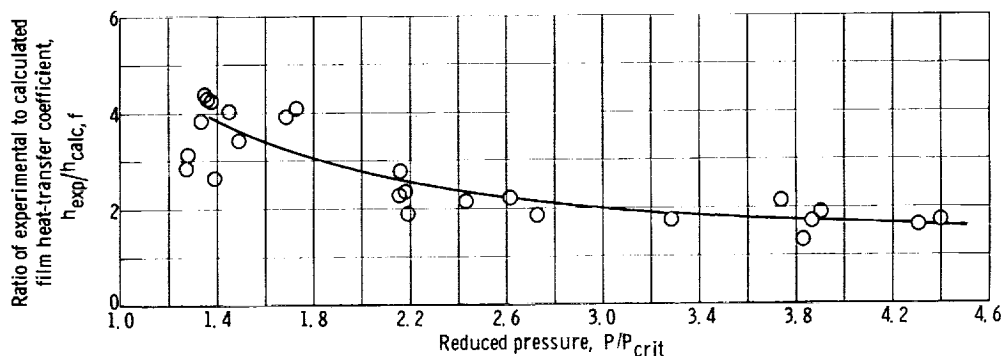


Figure 7. - Ratio of selected heat-transfer-coefficient data to gaseous prediction over range of pressure. Tube diameter, 0.335 inch; axial station, 4.5 inches from inlet heating flange.

prediction of wall-temperature maxima very difficult. Experiments that would delineate the effects one by one are warranted. Even with such information available, the difficulty in predicting the maxima may be akin to predicting the location of the transition zone from laminar to turbulent boundary layers on an aerodynamic body; the prediction technique may have to rely heavily on statistical information.

#### Effect of Pressure on Near-Critical Heat-Transfer Results

Examination of the supercritical-pressure data of appendix F and, in particular, the column identified as  $H/H_F$  serves to illustrate how increasing the pressure affects the heat-transfer results. The term  $H/H_F$  is the ratio of the experimental heat-transfer coefficient to that predicted by the Nusselt film correlation for gaseous hydrogen (ref. 17). The data presented in figure 7 for  $EL = 4.5$ , or  $L/d = 13.5$  indicate that the  $H/H_F$  ratio changes from 3 to 4 at nominally 200 pounds per square inch absolute to about 1.5 at 800 pounds per square inch absolute<sup>2</sup>. These data illustrate a trend toward the gaseous-hydrogen correlation as pressure is increased. Figure 7 is not to be interpreted as a correlation curve, but only as an example of a gross trend in the heat-transfer data as pressure increased at a fixed  $L/d$  and the bulk temperature remained less than or equal to the transposed critical temperature.

#### Effect of Wall-Heat-Flux Gradient

Because this heated tube investigation is oriented toward the rocket-engine-cooling problem, certain specialized tests are warranted that simulate flow or heat-flux conditions in the rocket coolant passages. One such simulation is an axial distribution of heat flux along the heated tube. The electrically heated test section was constructed with a tapered wall thickness (see fig. 8) so that the power generation maximized in the middle. The flow area was constant throughout the tube. The tabulated data pertinent to this test section appear in table VI.

<sup>2</sup>The more recent results of refs. 18 and 19 illustrate the validity of the Nusselt film-type correlation at pressures above 1000 psia.

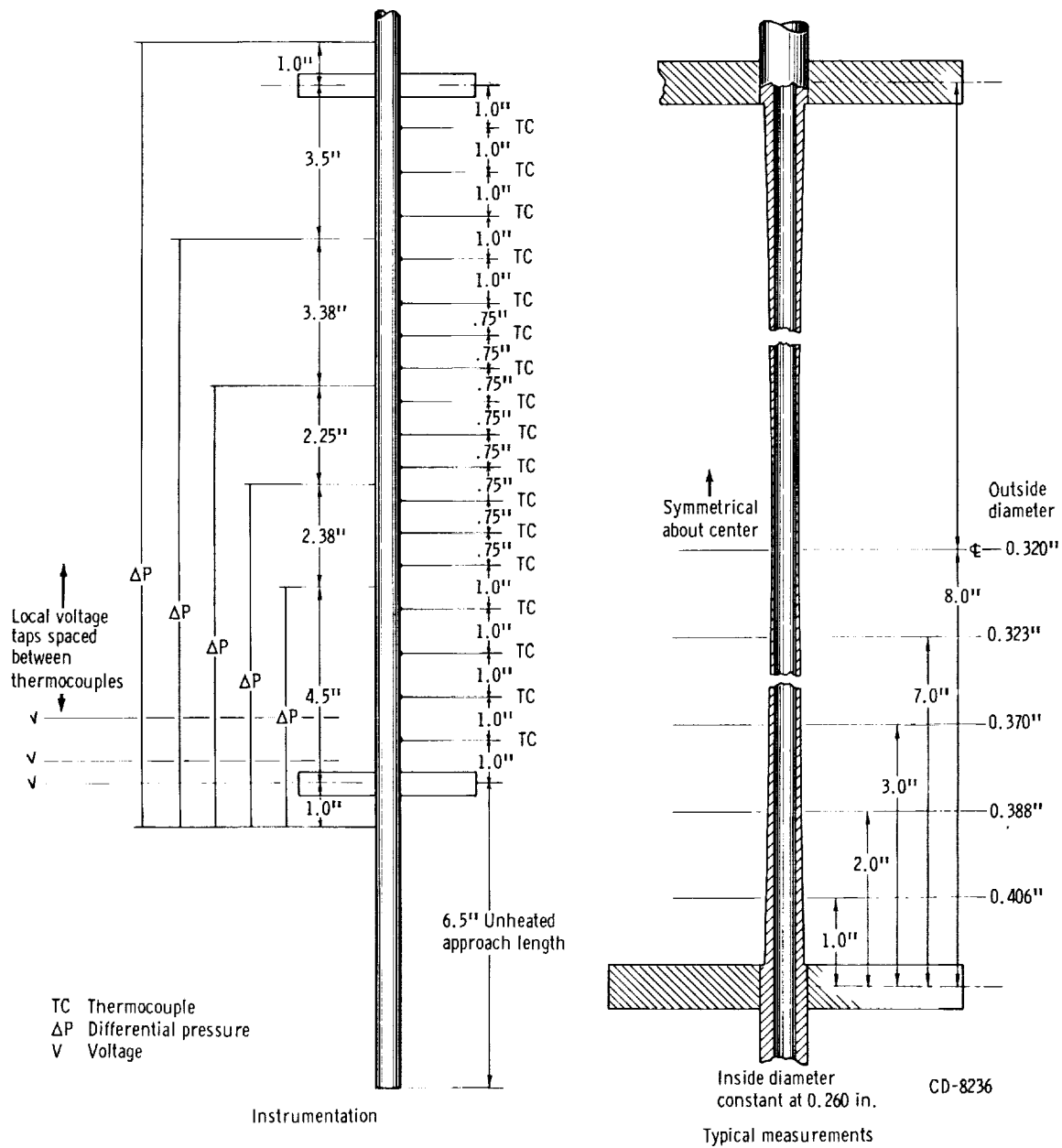


Figure 8. - Test section for axial heat flux gradient.

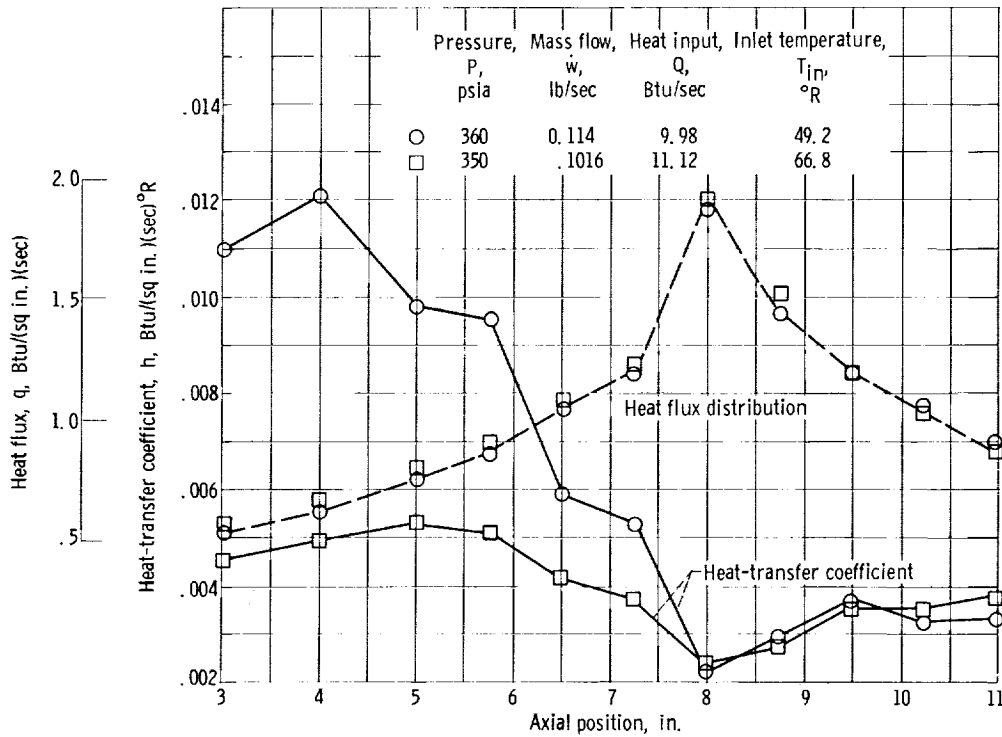


Figure 9. - Surface temperature and heat-flux distribution for variable heat-flux test section.

Figure 9 shows heat flux and heat-transfer-coefficient data plotted as a function of axial position for two runs with different inlet-bulk-temperature levels. Comparing the low temperature and higher temperature-inlet conditions shows that the heat-transfer coefficients for the low-temperature fluid are appreciably higher than those of the other, and both conditions exhibit about the same coefficients downstream of the maximum heat-flux condition. It is obvious that the heat-transfer coefficient minimizes in the vicinity of the maximum heat flux. The dropoff in the level of the heat-transfer coefficient is most dramatic for the lower inlet-bulk-temperature data. It should be kept in mind that the bulk temperature is approaching the transposed critical value in the vicinity of the high flux region.

Two important geometric effects in an actual rocket cooling passage, curvature and variations in tube passage area, are missing from this simulation. Thus, figure 9 cannot be interpreted to be a typical heat-transfer-coefficient distribution along a cooling passage. It illustrates only one aspect of the overall problem.

#### Observations of Flow Oscillations

Prior heat-transfer research has established the importance of flow oscillations in influencing the level of convective heat transfer. For example, reference 20 noted an appreciable enhancement in the heat transfer to gaseous hydrogen flowing through electrically heated tubes when high-frequency oscillations



tions occurred. Generally, flow oscillations are to be avoided despite the increase in heat-transfer rate because of resultant instabilities and destructive tendencies in heat-transfer equipment.

In forced-convection heat-transfer experiments, it is thus necessary to record the presence of flow oscillations because of the significant influence they can have on the results and the interpretation of the results. In this investigation, piezoelectric pickups were mounted on plates that were cantilevered from the inlet or the outlet bus-bar flanges (see fig. 2, p. 5). Of course, the pressure transducers attached to the tube sensed the lower frequency oscillations as well. With this limited instrumentation, it was possible to make qualitative observations of the flow oscillations in both the subcritical- and supercritical-pressure regimes.

A broad spectrum of frequencies was observed that ranged from 1/2 cycle up to several kilocycles per second. The prevalent frequencies differed in going from the subcritical pressures up into the supercritical. In the operation of the apparatus it was noted that there were conditions of violent instability where it was difficult to set an operating point. This was called "unstable operation." There were other regions where the accelerometers indicated oscillations present, but it was comparatively easy to set an operating point and hold that operating condition indefinitely. This was called a "quasi-steady" condition. Figure 10 depicts both of these conditions qualitatively as regions in a diagram of heat flux as a function of mass flow. Generally, it was observed that the unstable-operation regions (dark) were small and the quasi-steady regions (shaded) were larger. Note the elongated shape of these regions with respect to mass flow. This meant that it was easier to move out of these flow oscillations by increasing or decreasing the heat-flux level than by changing the flow rate. This result could be interpreted to be the result of an axial movement along the test section of the point where the fluid reaches the transposed critical temperature.

Obviously, these observations of fluid oscillations cannot be considered to be very general because the fluid oscillation problem is a very complex one, and many important parameters are related to the peculiarities of a particular system or a particular fluid. It is important, however, that the potential presence of flow oscillations in a near-critical forced-convection system be considered in any heat-transfer analysis because the oscillations can influence the heat-transfer level.

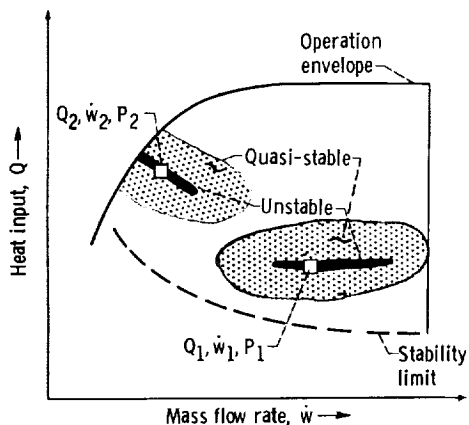


Figure 10. - Some observed oscillation characteristics for inlet temperature less than critical temperature at two typical operating conditions.

## DISCUSSION OF CORRELATION TECHNIQUES

### Correlating Parameters

The tabulated data are used to calculate various parameters that are plotted to illustrate the variations in the correlation methods

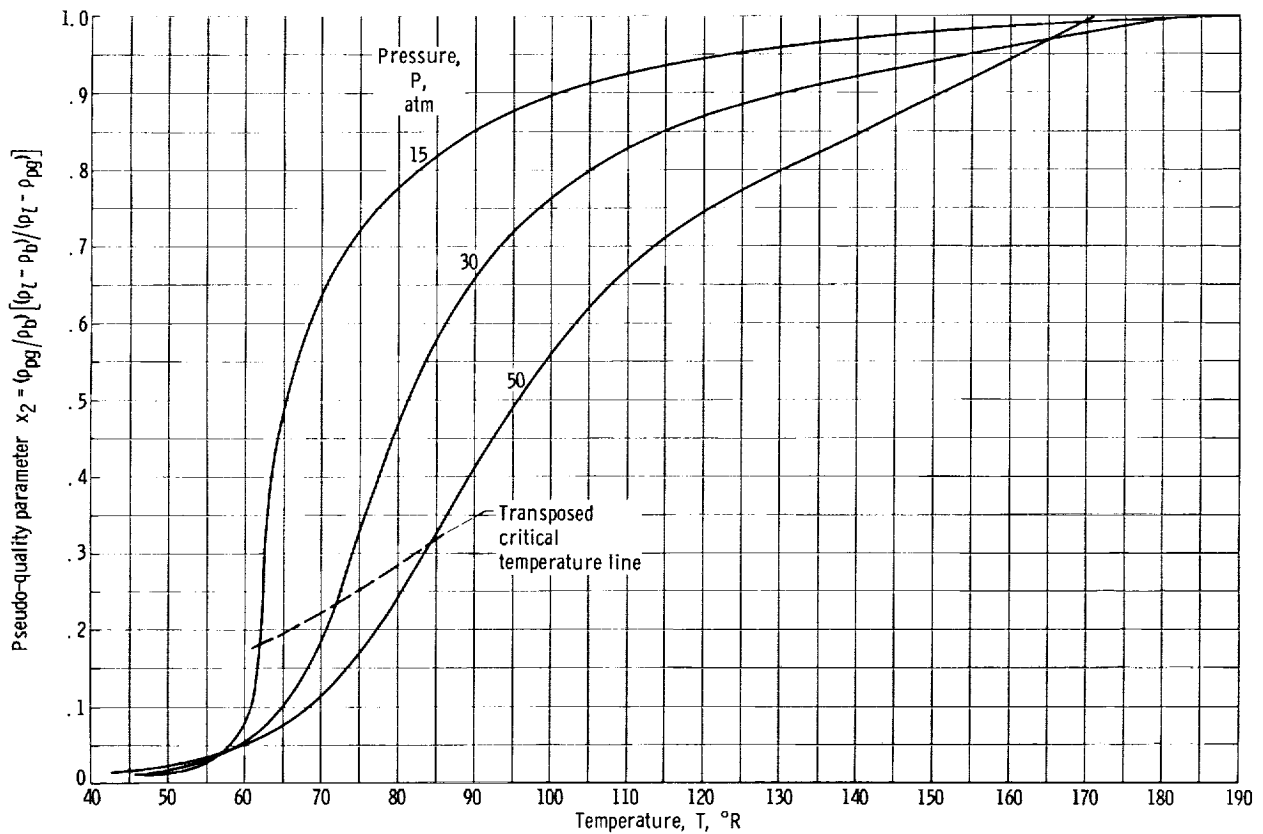


Figure 11. - Pseudo-quality parameter  $x_2$  over range of bulk temperature with pressure as parameter.

and the effects of the parameters. Several correlations obtained from the literature and two new correlations will be presented and discussed in this section.

In reference 15, it was shown that the Martinelli two-phase parameter  $\chi_{tt}$  could be employed in the correlation of either the two-phase or the near-critical fluid heat-transfer data. For the supercritical condition, a pseudo-two-phase model of the fluid was postulated and a quality (mass ratio of light species to total mixture of light and heavy species) was defined. The definitions of the light and heavy species used in computing the quality are presented in appendix B. These definitions differ somewhat from their original definitions in reference 15. Figure 11 is presented to show how the pseudo-quality parameter  $x_2$  varies over a range of bulk temperatures with pressure as a parameter. The locus of the transposed critical points is indicated in the figure. The Martinelli parameter  $\chi_{tt}$  is primarily dependent on  $x_2$  (see eq. (B14)), so that this figure is helpful in interpreting the meaning of the numerical values of  $\chi_{tt}$ . In general, large values of  $\chi_{tt}$ , that is, low  $x_2$ , denote liquid-like fluid, while low values of  $\chi_{tt}$ , that is, high  $x_2$ , denote gas-like fluid. For most of the data herein,  $\chi_{tt}$  greater than 1 implies  $T_b$  less than  $T^*$ .

#### Correlations from Literature

In this section various predictions of Nusselt number (or film coefficient)

TABLE VIII. - NUSSELT PARAMETERS

Nusselt number	Parametric form	Reference	Regime of data to develop correlation	Figure	Plot
Calculated mean film, $Nu_{calc, fm}$	$Nu_f(\rho_{fm}/\rho_f)^{0.8}$	12	Supercritical liquid and subcritical liquid	12(a)	I
Total experimental, $Nu_{exp, tot}$	$hd/(A_l k_l + A_f k_f)$	15			
Calculated bulk, $Nu_{calc, b}$	$0.025 Re_b^{0.8} Pr_b^{0.4} (T_w/T_b)^{-0.55}$	20	Gas	12(b)	II
Calculated film, $Nu_{calc, f}$	$0.021 Re_f^{0.8} Pr_f^{0.4}$	17	Gas	12(c)	III
$Nu_{calc, v}$	$0.021 Re_f^{0.8} Pr_f^{0.4} (1 + 0.01457 v_w/v_b)$	21	Supercritical liquid and gas	12(d)	IV

from the literature will be divided by the experimental Nusselt number (or film coefficient) and plotted as functions of the Martinelli parameters  $\chi_{tt}$ .

Measured local heat-transfer data from all the stations on the test sections will be included even though it has been observed that the local data, wherein  $T_b$  is near or less than  $T^*$ , ellude a simple correlation procedure. The inclusion of these difficult stations illustrates to a coolant-passage designer the errors of prediction in the tube inlet.

Table VIII is a listing of the Nusselt parameters to be employed. They will be applied to the supercritical pressure domain only. The figures represent averaged or mean lines of all of the appropriate tabulated data. The actual scatter of the data for each test section is quite large ( $\pm 100$  percent) at high  $\chi_{tt}$  values, becoming moderate ( $\pm 30$  percent) at low  $\chi_{tt}$  values, depending of course on the test section and correlations considered.

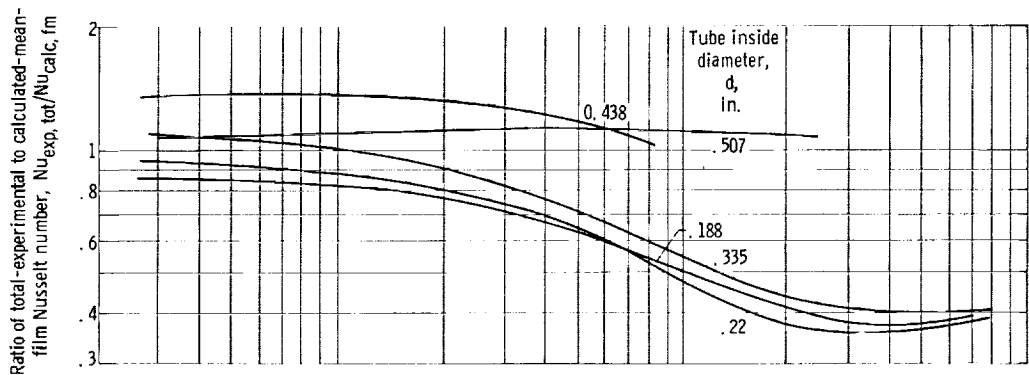
Plot I. - Figure 12(a) shows a family of modified Nusselt-Martinelli relations, an extrapolation of a two-phase-correlation approach. The parameters used are:

$$\frac{Nu_{exp, tot}}{Nu_{calc, fm}} = f(\chi_{tt}) \quad (1)$$

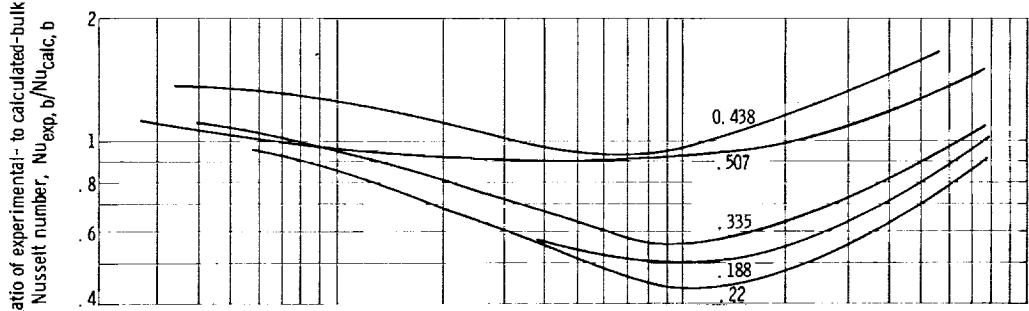
where

$$Nu_{exp, tot} = \frac{hd}{A_l k_l + A_f k_f} \quad (2)$$

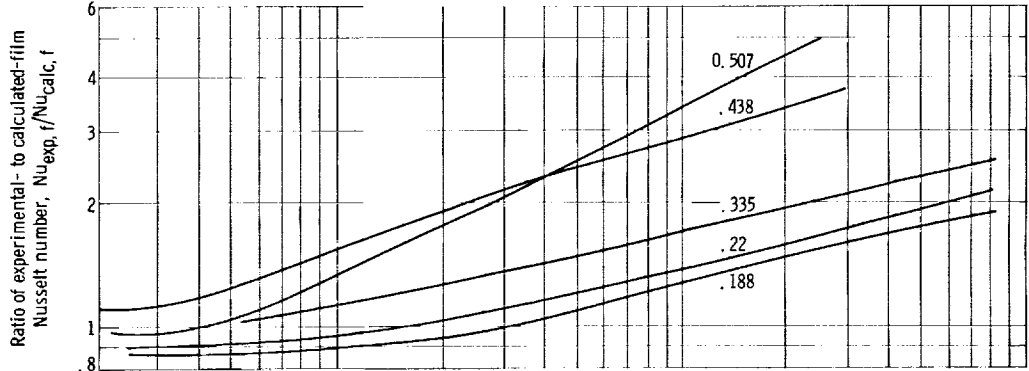
$$Nu_{calc, fm} = 0.021 \left( \frac{\rho_{fm} u_b d}{\mu_f} \right)^{0.8} \left( \frac{C_P \mu}{k} \right)_f^{0.4} \quad (3)$$



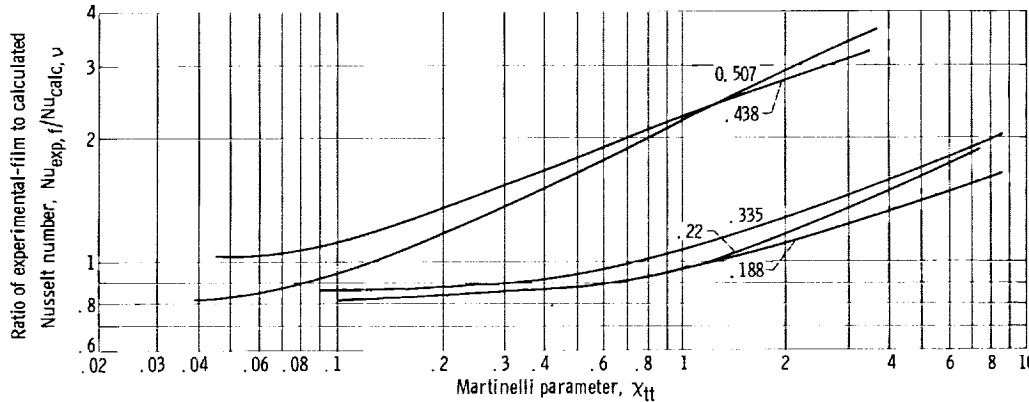
(a) Calculated Nusselt number defined in references 12 and 15.



(b) Calculated Nusselt number defined in reference 20.



(c) Calculated Nusselt number defined in reference 17.



(d) Calculated Nusselt number defined in reference 21.

Figure 12. - Correlation of local supercritical heat-transfer data as function of Martinelli parameter.

where

$$\frac{1}{\rho_{fm}} = \frac{x_2}{\rho_f} + \frac{1 - x_2}{\rho_g} \quad (4)$$

and  $x_2$  and  $\rho_g$  are defined in appendix B. This figure indicates several things: there appears to be a diameter effect, the parametric grouping overpredicts the heat-transfer coefficient when  $X_{tt} \sim 1$ , and the trends in the data are similar to those reported in reference 12 for subcritical film boiling. Moreover, the plot indicates the feasibility of the mechanism of reference 15, but the correlation should be applied with caution outside the domain of definition; a combination of mechanisms will probably be required to describe the entire fluid domain and the tube entrance region.

Plot II. - Figure 12(b) illustrates a widely used gaseous-hydrogen correlation. The modified Nusselt number, developed in reference 20, was based on bulk properties with a  $(T_w/T_b)^D$  correction factor. The parameters used are

$$\left. \frac{Nu_{exp}}{Nu_{calc}} \right|_b = f(X_{tt}) \quad (5)$$

where

$$Nu_{exp} = \frac{hd}{k_b} \quad (6)$$

and

$$Nu_{calc,b} = 0.025 Re_b^{0.8} Pr_b^{0.4} \left( \frac{T_w}{T_b} \right)^{-0.55} \quad (7)$$

The deviation from unity here is indicative of the danger in extrapolating a gas correlation into this region. However, note that when the ratio of experimental to calculated Nusselt numbers is viewed as a function of  $X_{tt}$ , trends toward a correlation become evident. As one can readily discern, this correlation, first underpredicts at high  $X_{tt}$ , then overpredicts (midrange of  $X_{tt}$ ), and finally slightly underpredicts (low  $X_{tt}$ ) the heat-transfer coefficient. Again, some effects of diameter can be noted. One might quickly cite the former plot where the same trends are noted; the difference is that the previous correlation was initially postulated on a pseudo-quality concept with  $X_{tt}$  as a parameter but the gas correlation was not. It was apparent that, in order to extend this correlation into the near-critical regime, further modifications would be required.

Plot III. - Figure 12(c) illustrates the ordinary film correlation (ref. 17), which is shown to underpredict the film coefficient over a wide range in  $X_{tt}$ . Another undesirable result of this correlation is the spread in the

data for various tube diameters. There does, however, appear to be a parallelism in the plotted data, as indicated in the figure. The parameters used are

$$\left. \frac{\text{Nu}_{\text{exp}}}{\text{Nu}_{\text{calc}}} \right|_f = f(\chi_{tt}) \quad (8)$$

where

$$\text{Nu}_{\text{exp},f} = \frac{hd}{k_f}$$

and

$$\text{Nu}_{\text{calc},f} = 0.021 \left( \frac{\rho_f u_b \bar{a}}{\mu_f} \right)^{0.8} \text{Pr}_f^{0.4} \quad (9)$$

Because of the apparent parallelism in the data for tubes of different diameters, perhaps these lines could be correlated by some suitable function involving the ratio of transverse velocity to local velocity

$$\text{Nu} = f \left( \frac{u_1}{u_b} \right) \quad (10)$$

where  $u_1/u_b$  is defined and calculated in appendix B. Such a technique will be explored in a later section; the approach is empirical in nature, however, and has not as yet been substantiated theoretically.

Plot IV. - The fourth plot (fig. 12(d)) is a correlation technique developed from theoretical considerations in reference 21. Essentially the Nusselt modification is the addition of a term that follows the wall- and bulk-temperature variations rather closely; however, the relation is still not very useful at large  $\chi_{tt}$  or low  $L/d$ . The parameters used are

$$\frac{\text{Nu}_{\text{exp},f}}{\text{Nu}_{\text{calc},f} \left( 1 + 0.01457 \frac{v_w}{v_b} \right)} = f(\chi_{tt}) \quad (11)$$

where  $\text{Nu}_{\text{exp},f}$  and  $\text{Nu}_{\text{calc},f}$  have the same definitions as for figure 12(c). For bulk temperatures above the transposed critical temperature, the correlation closely approximates the majority of the data. Note, however, that the correlation underpredicts at the high  $\chi_{tt}$  values and apparently is a function of test-section diameter or  $L/d$ .

The  $v_w/v_b$  ratio in equation (11) could be represented as a function of  $T_w/T_b$  at temperatures above  $T^*$ ; at lower temperatures, however, the ratio can

TABLE IX. - CORRELATING PARAMETERS

Nusselt number or ratio	Parametric form	Regime of data used to develop correlation	Figure	Plot
Empirical Nusselt number, $Nu_{calc}$	$0.021 \left( \frac{\rho_f u_b d}{\mu_f} \right)^m Pr_f^{0.4} \left\{ 1 + 15 \left( \frac{P_b}{P_{crit}} \right)^{0.4} \times \left[ 1 + \left( \frac{\rho_f}{\rho_b} \right)^{2/3} \right] \right.$ $\left. \times \frac{q}{\rho_f u_b (H_f - H_b)} \left( \frac{u_b^2}{gd} \right)^{-0.1} \right.$	Supercritical pressure fluid regime; data of this report	13(a)	V
Correlating parameter, Y	$Y = \frac{\left( \frac{qC_{p,f}}{H_w - H_b} \right) \frac{d}{k_f}}{0.0714 Re_f^{0.87} Pr_f^{0.4} Sr^{1/3} \left[ 1 + \exp(-L/4D) \right]}$	Supercritical pressure fluid regime; data of this report	15(a) and (b)	VI

no longer be easily reduced in terms of the  $T_w/T_b$  ratio. For  $T_b$  sufficiently removed from the critical region,  $\mu/\mu_s \propto (T/T_s)^{1/2}$  to  $2/3$  and  $\rho/\rho_s \propto T_s/T$ , where the subscript  $s$  is a reference state; hence,  $\nu_w/\nu_b \propto (T_w/T_b)^{3/2}$ . More important to note is that the correction term in the denominator of equation (11) becomes unity only as  $\nu_w/\nu_b \rightarrow 0$ . For all other values of  $\nu_w/\nu_b$ , the predicted heat-transfer coefficient will be greater than the coefficient predicted by using  $Nu_{calc,f}$ ; however, the increase will be small for  $\nu_w/\nu_b \propto 1$ . This, according to figure 7 (p. 16), would be correct for the pressure and  $T_w/T_b$  ranges discussed herein.

#### New Correlations

Two correlation schemes devised in this report will be presented. To be consistent with the previous section, these correlations will be presented in figures in which  $X_{tt}$  is the abscissa. The correlating parameters are listed in table IX.

Plot V. - In figure 13(a), the ordinate is equation (B25), which is a ratio of experimental to predicted Nusselt numbers. This predicted Nusselt number includes a ratio of the transverse to axial velocity  $u_1/u_b$  that was mentioned in the discussion of plot III. Appendix B contains a detailed derivation of the ratio  $u_1/u_b$ , sometimes called the Stermann parameter  $Sr$ , and a curve fit for the exponent  $m$ . Originally it was applied to the prediction of a two-phase heat transfer (ref. 22). Much of the derivation in appendix B is devoted to making this parameter applicable to a supercritical fluid.

The correlation approach was reasonably successful in grouping the data over a wide range of  $X_{tt}$ . Figure 13 shows only an estimated mean line through

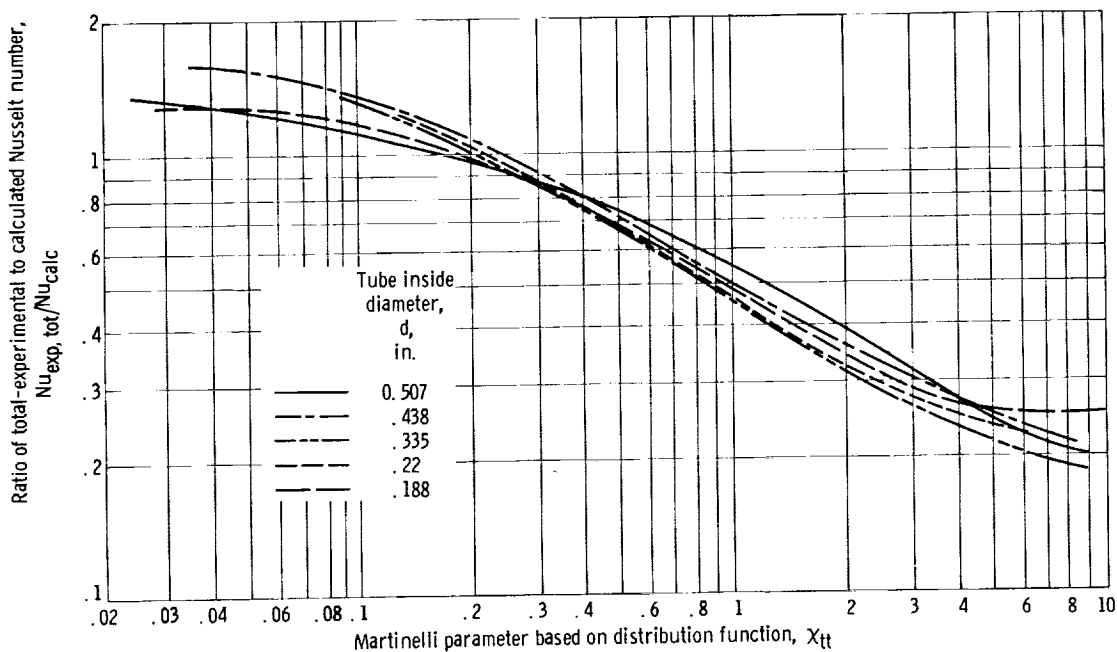


Figure 13. - Correlation of local supercritical heat transfer data as function of Martinelli parameter defined in table IX and appendix B (eq. B26).

the data, but the maximum scatter was of the order of 40 percent for most of the data. However, there is always the danger that some parameter or parameters may have been suppressed. More will be said about this point at the end of this section, because the comment is pertinent to all the correlations presented.

Plot VI. - A comparative examination of the data on the basis of test-section diameter revealed that the larger tube (0.438- and 0.507-in. i.d.) data are segregated from the smaller tube (0.335-in. i.d. and smaller) data. This can be seen clearly in figure 12 and to some extent in figure 13. Consequently, another correlation was introduced, retaining the Stermann parameter of Plot V (fig. 13(a)), and also involving a term  $1 + e^{-L/4d}$ , to correct for  $L/d$ . The correlating parameter  $Y$  is expressed as

$$Y = \frac{\left( \frac{qC_{P_f}}{H_w - H_b} \right) \frac{d}{k_f}}{0.0714 \text{Re}_f^{0.87} \text{Pr}_f^{0.4} \text{Sr}^{1/3} (1 + e^{-L/4d})} = f(X_{tt}) \quad (12)$$

The numerator in equation (12) is the experimental Nusselt number based on enthalpy difference, with specific heat evaluated at film conditions, and not on the usual temperature difference. The denominator of the correlating parameter  $Y$  is a modified film Nusselt number with a Stermann parameter coefficient and an exponential  $L/d$  coefficient that approaches unity for large  $L/d$  ratios. The exponents for the dimensionless groups in equation (12) were determined by data cross plots and fits. For example, the exponent for the film Reynolds



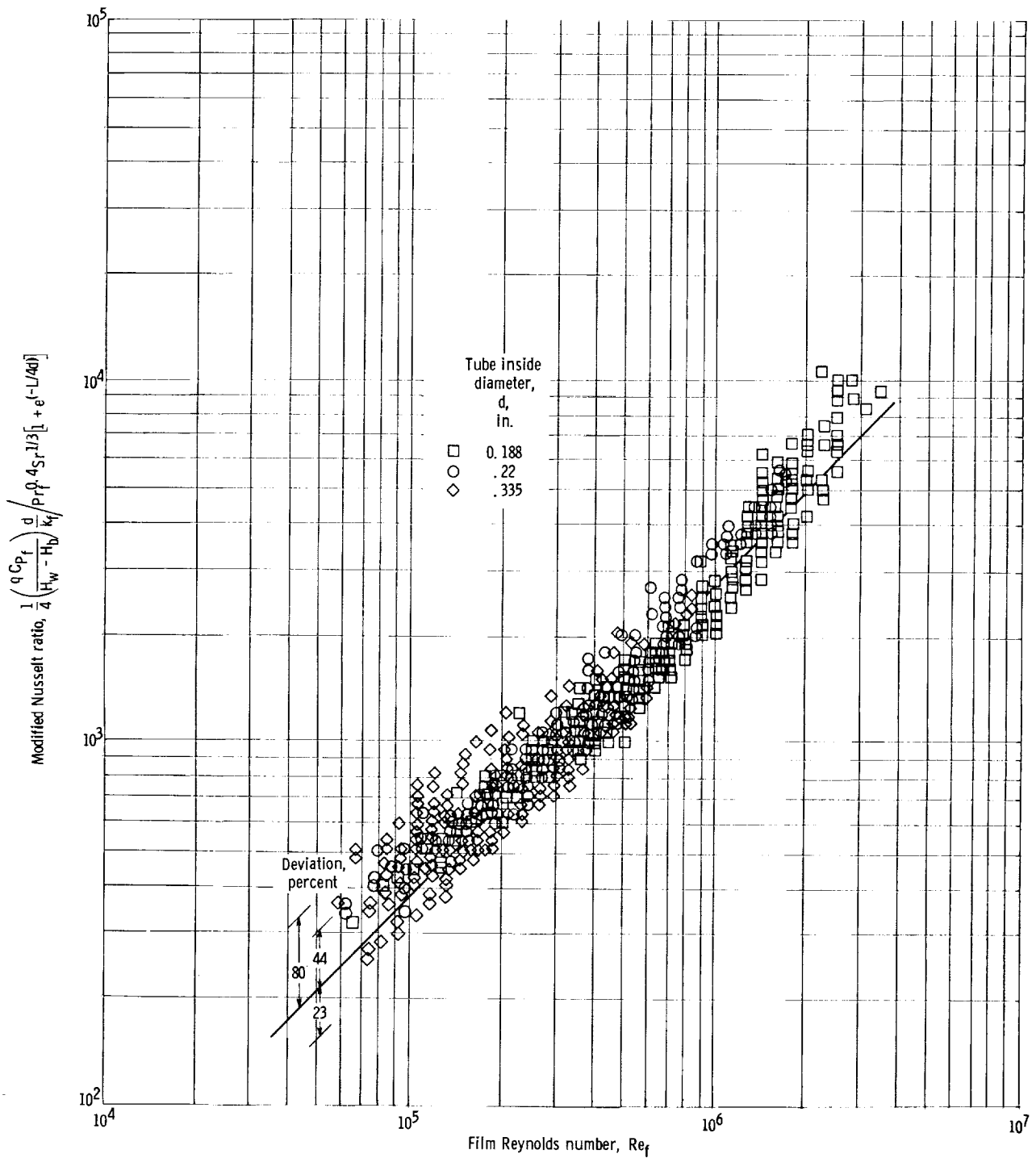


Figure 14. - Data fit of exponent on film Reynolds number for Y parameter correlation.

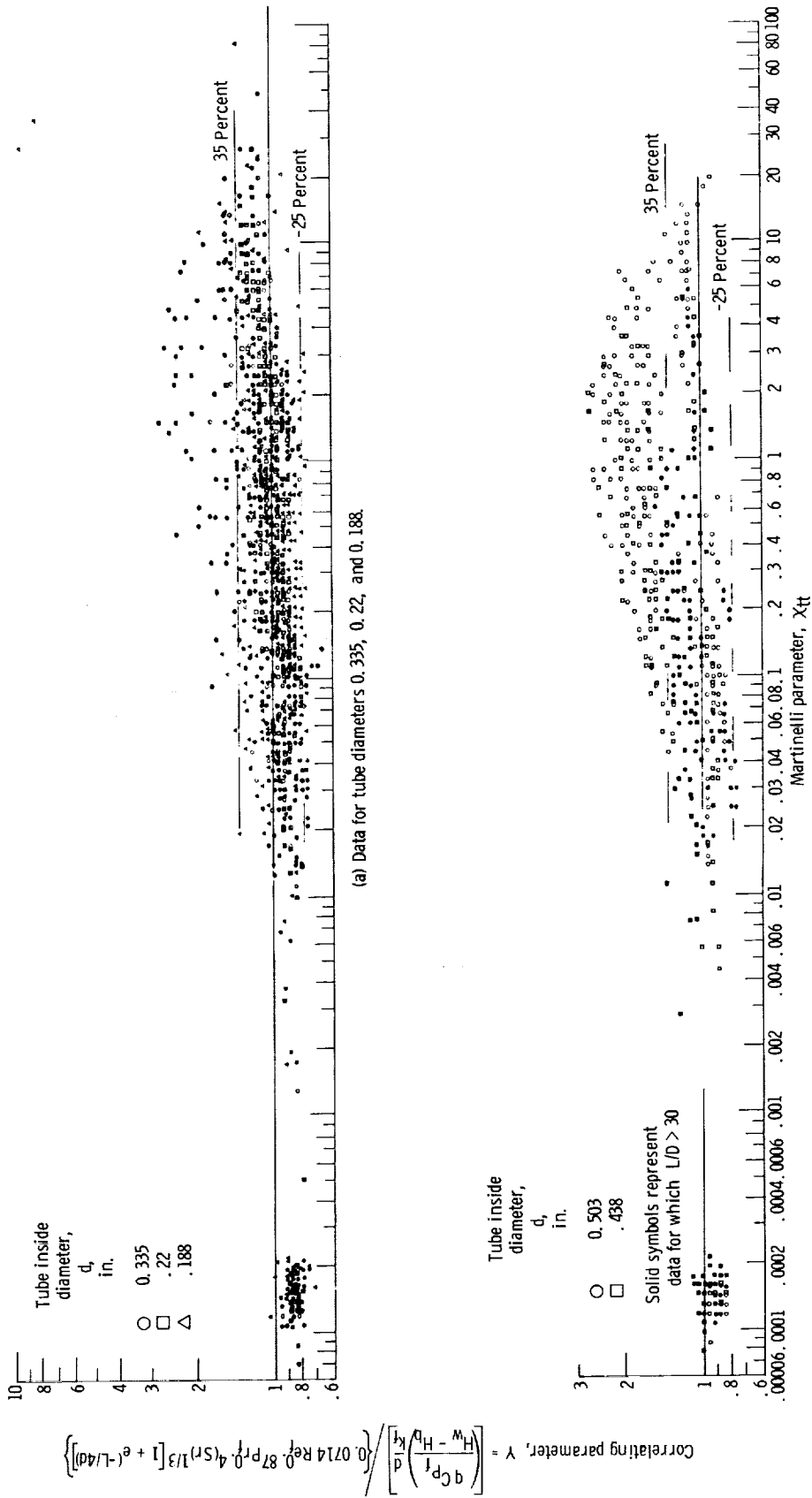


Figure 15. - Variation of correlating parameter Y with Martinelli parameter.

number was obtained from a judged best fit of the data, a portion of which is shown in figure 14.

Plot VI presents, respectively, the correlation grouping of the smaller diameter test sections and the larger diameter (nominal 1/2 in.) test sections (figs. 15(a) and (b)). All the test-section stations are plotted for the entire supercritical-pressure regime reported (200 to 800 psia). It is interesting to observe that, if the data points for  $L/d < 30$  (open symbols in fig. 15(b)) are omitted, the remaining data from both the large and small test sections can be correlated within +35 and -25 percent. (It must be admitted that omission of the entrance stations,  $L/d < 30$ , would reduce the scatter in all the correlations presented herein.) It is further noted that the correlating parameter  $Y$ , which includes the transverse velocity ratio  $Sr$ , practically eliminates all dependence on  $X_{tt}$ .

#### Errors in Predictions from Correlations

In applying heat-transfer correlations of the type presented herein (e.g., eq. (7)), a designer must take particular care in calculating parameters from the correlations because of the danger of suppression of variables in the equations. For example, at low  $T_w/T_b$  ratios, an error in the prediction of  $T_w$  is not serious since  $T_w \approx T_b$ . At high  $T_w$  values,  $T_w - T_b \approx T_w$ , and the fluid properties are usually controlled by some  $T_s$  that is influenced by  $T_w$ , such as  $T_f$ . As a result, any Nusselt type correlation modified by  $(T_w/T_b)^p$  parameter when  $p$  is large, suppresses the effect of  $T_w$  in the correlation, while attempting to modify the correlation to account for boundary-layer changes. Similarly, the inclusion of the transverse to free-stream velocity parameter  $Sr$  in a Nusselt type relation, will suppress the effect of  $q$  and  $u$ .

For some applications it may not matter if the scatter of certain parameters does occur. For instance, in the correlations discussed, any one of them would be suitable for predicting heat-transfer-coefficient values, especially for bulk temperatures well above  $T^*$ . On the other hand, figure 16 illustrates the difficulty that arises when a correlation must be back-calculated to produce a wall-temperature or heat-flux value accurately. In this figure, the Nusselt film correlation is replotted from figure 12(b) to show the variation in calculated heat-flux values. Unfortunately, this is the problem usually faced by a rocket-nozzle designer. Anyone who designs hydrogen coolant passages should be aware of this limitation and should make an evaluation of the potential errors incurred. This would involve an examination of the original heated-tube data in the bulk fluid domain of interest. The extensive tabulation of data in this report is presented to aid in this important function.

#### Subcritical Hydrogen Heat-Transfer Correlation

In the previously reported two-phase hydrogen program (ref. 12), the experimental data were bounded by the saturation vapor line at pressures less than 75 pounds per square inch absolute. Herein, experimental data are reported that cross the saturated vapor line and approach the perfect gas state. The nominal pressure ranged from 80 to 175 pounds per square inch absolute, where the crit-

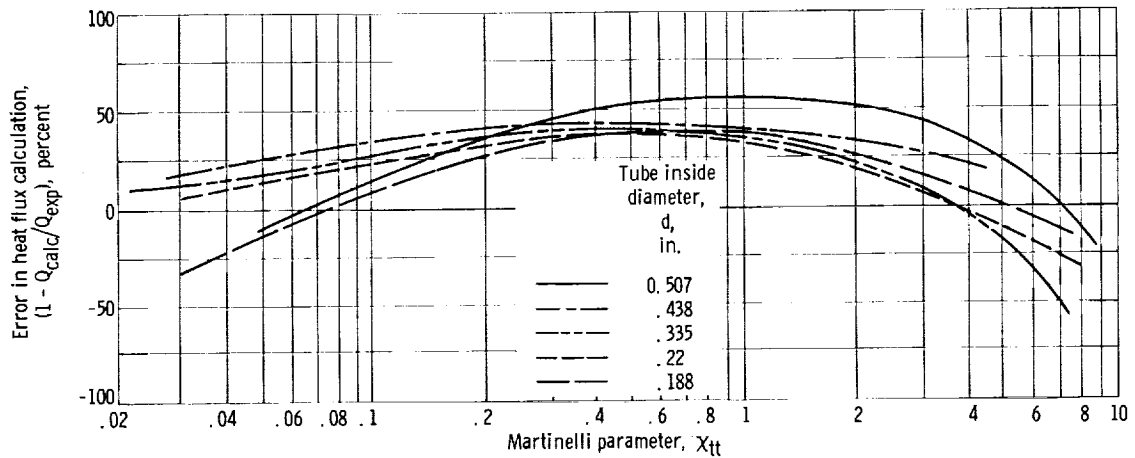


Figure 16. - Sensitivity of back-calculated heat-flux values to film-coefficient correlation, equations (5) to (7) (based on curve fit to all data of table IV).

ical pressure is 187 pounds per square inch absolute. Essentially, the same correlation technique is applied to these data within the two-phase region as was applied in reference 12. For data crossing the saturation vapor line into the superheat region, the approach of reference 15 was employed. The technique of this reference was to devise a pseudo-quality  $x_2$ , which may be applied to both subcritical and supercritical states.

Analysis of subcritical data using quality  $x$ . - In order to compare the data reported herein with previous data from reference 12 it was necessary to recompute and replot the data of reference 12. Data from both sources are shown in figure 17(a). For the data of this report all the instrumented stations on the tube, after the first appearance of vapor phase, were included.

Although not apparent in figure 17(a), it was observed, for pressures near the critical pressure, that heat-transfer coefficients banded 5 to 10 percent above the correlating line. A similar trend was noted with increasing diameter.

The Martinelli parameter  $X_{tt,x}$  and  $Nu_{calc, fm}$  were evaluated by using the quality  $x$  based on thermodynamic equilibrium. Even though thermodynamic equilibrium may not prove to be a good assumption, at this time there is not a good way to determine the actual void distribution. Visual studies of two-phase flow with heat transfer have shown that the assumption of thermal equilibrium will not produce accurate predictions of the void distribution (see ref. 23). A best fit through the data of figure 17(a) gives a correlation for convective film boiling of liquid hydrogen for a pressure domain of 25 to 175 pounds per square inch absolute:

$$\frac{Nu_{exp, f}}{Nu_{calc, fm}} = \frac{1}{0.7 + 2.4 X_{tt, x}} + 0.15 \quad (13)$$

A similar equation was advanced in reference 24, which appears to agree with equation (13) within property variations and experimental error.

When nonequilibrium characteristics are not large, equation (13) should describe subcritical convective film-boiling data up to pressures near the critical value.

Analysis of subcritical data using pseudo-quality  $x_2$ . - The technique advanced in reference 15 is essentially represented by equation (1). When this method is applied to the subcritical data, it must be remembered that the pseudo-quality  $x_2$  is not an explicit function of temperature and pressure in the two-phase region. At a given pressure, the bulk density  $\rho_b$  was evaluated by using the actual or calculated quality  $x$ , and this density was in turn used to determine  $x_2$ , as shown in appendix B.

This value of  $x_2$  is used in equation (1) to replot the subcritical data in figure 17(b) with the Martinelli parameter  $\chi_{tt}$  as the abscissa and  $Nu_{exp,tot}/Nu_{exp,fm}$  as the ordinate. The data in figure 17(b) extend from the two-phase region well into superheat region; the extension into subcooled liquid was carried for no more than two experimental stations on the test section, however. The data of figure 17(b) are fit by the equation

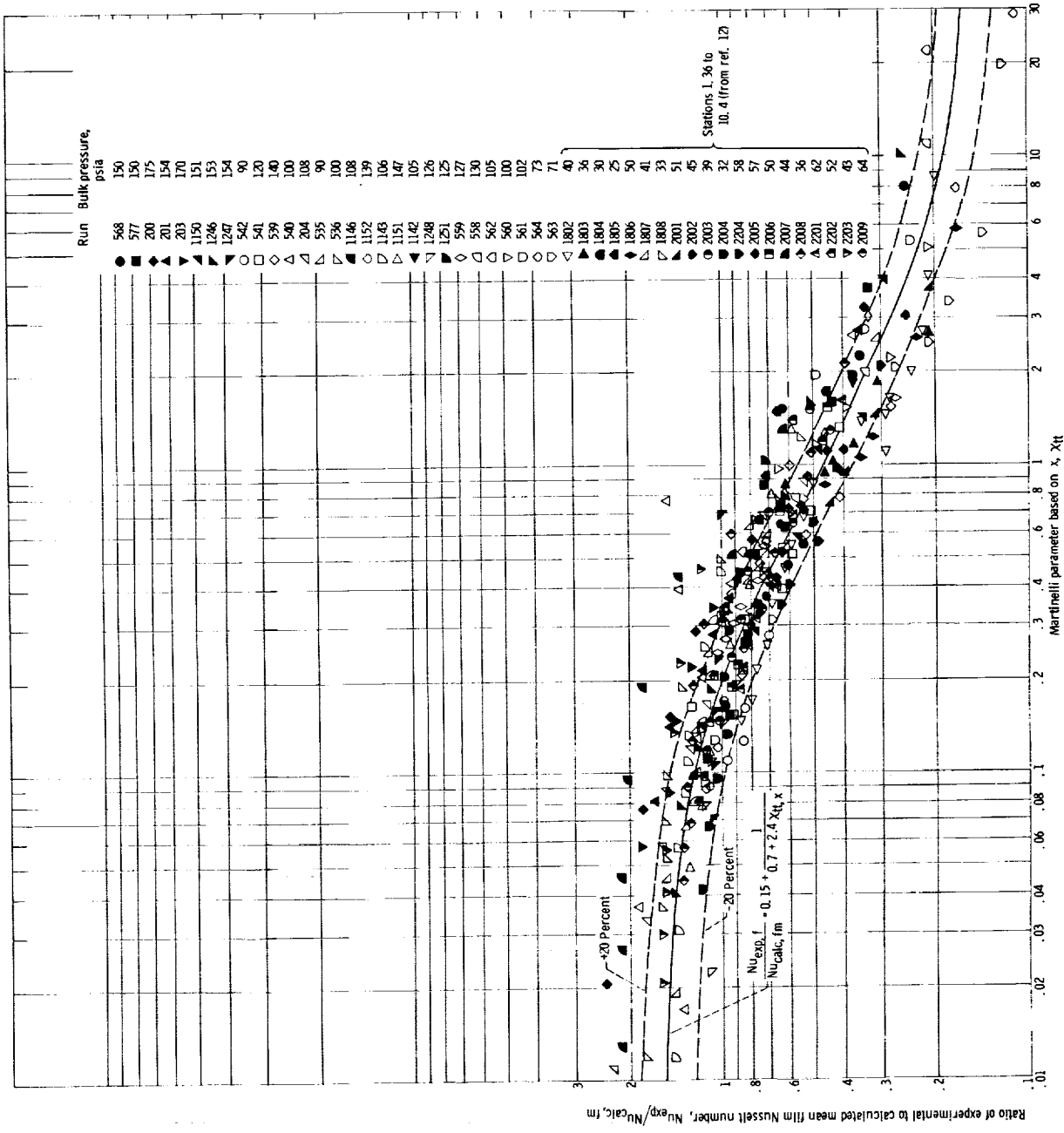
$$\frac{Nu_{exp,tot}}{Nu_{calc,fm}} = \frac{1}{0.81 + 2.52 \chi_{tt}} + 0.12 \quad (14)$$

Equation (14) should cover the liquid-hydrogen data for convective film boiling from a condition slightly subcooled through the two-phase region well into the superheat region. (For many of the data,  $Nu_{exp,tot} \approx Nu_{exp,f}$ .)

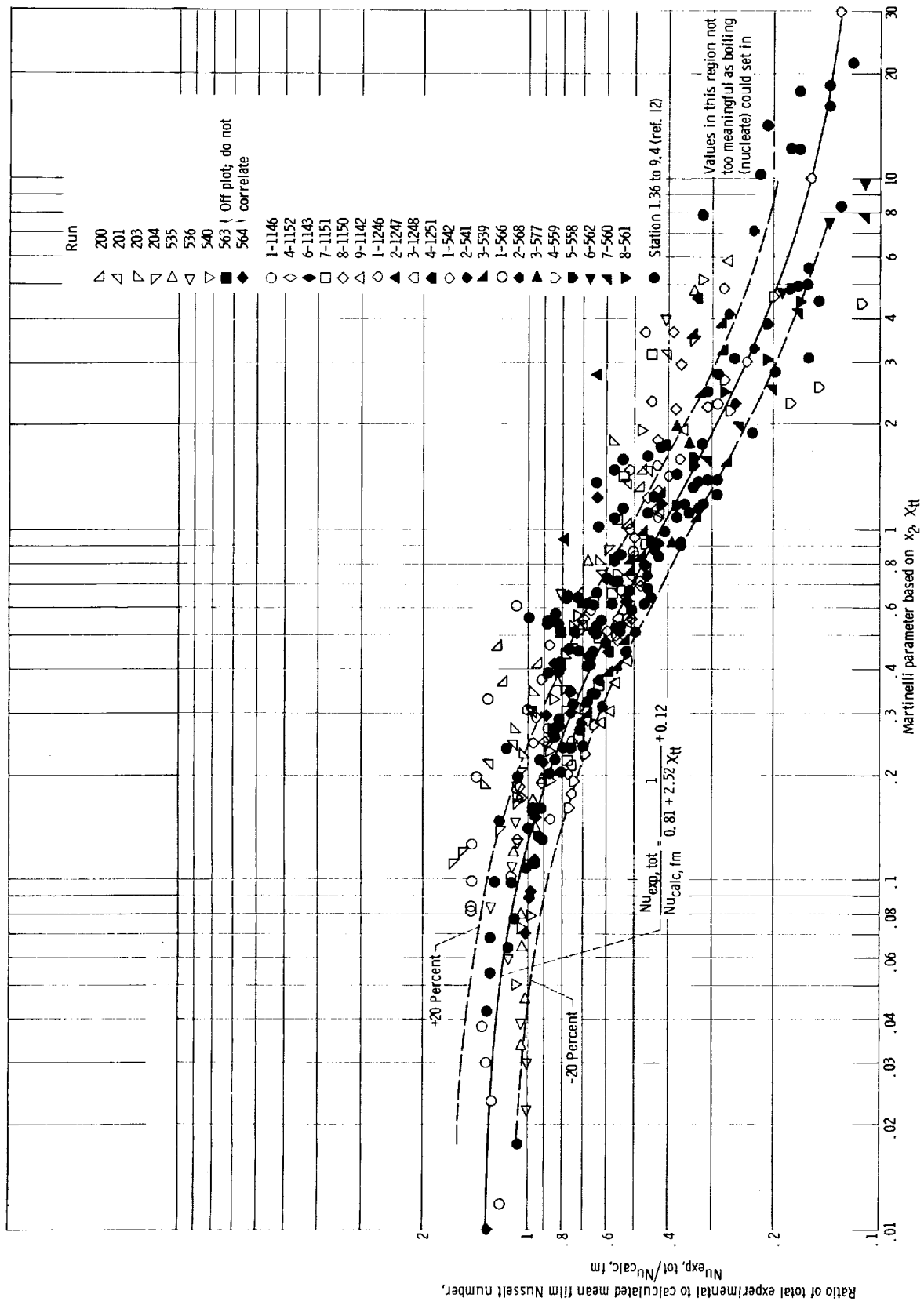
#### CONCLUDING REMARKS

This report presents extensive tables of experimental heat-transfer data for cryogenic hydrogen heated electrically in vertical tubes. Data covered subcritical and supercritical pressures from 80 to 800 pounds per square inch absolute, mass fluxes from 100 to 1000 pounds per square foot per second, and heat fluxes up to 3 Btu per square inch per second. The data tables are in a form useful to the designer of rocket coolant passages.

The results of this investigation reinforce previously reported observations by the authors in which the similitude between two-phase and near-critical hydrogen heat-transfer data was pointed out. For uniform heat flux, both the subcritical and near-critical wall-temperature data exhibited a pronounced maximum for inlet temperatures below transposed critical or saturation. To the first order, this maximum occurred near the saturation bulk temperature for subcritical fluids and near the transposed critical point for supercritical fluids. The effects of inlet conditions and fluid properties on this maximum were not clearly delineated, and these should be the subject of further tests. Qualitative observations of flow and pressure oscillations were made in both the subcritical and supercritical pressure regimes. Such oscillations have importance in controlling the heat-transfer process and must be taken into account in any



(a) Based on reference 12 and table V for pressure domain of 25 to 175 pounds per square inch absolute.  
 Figure 17. - Subcritical hydrogen heat-transfer data.



(b) Based on pseudo-quality  $x_2$  for at least one station prior to saturated liquid line to beyond saturated vapor line.

Figure 17. - Concluded.

general correlation analysis.

For the supercritical pressure state, the Nusselt number, defined by a number of methods, was divided by the experimental value and plotted as a function of the Martinelli parameter. Several of these methods showed promise as means of correlating local Nusselt numbers, as long as the bulk temperature was above the transposed critical temperature and the station was not too close to the entrance of the heated part of the test section. These methods for correlating near-critical Nusselt numbers were superior to convective correlation schemes in which the Reynolds number is the major independent variable. However, it was shown that a considerable error can be incurred if a parameter like heat flux is back-calculated from one of the correlations. Any correlation scheme is susceptible to this kind of difficulty, because variables are often suppressed through a numerically low exponent, and great care should be taken when these correlations are used in design calculations.

For bulk temperatures less than the transposed-critical and near-critical pressure, the experimental heat-transfer coefficient was observed to be three or four times greater than the prediction of a standard forced-convection correlation. With increasing pressure, the experimental values would more closely approach the standard correlation and thus agree more closely with gaseous hydrogen results.

A revised correlation of the data from reference 12 and subcritical data reported herein is presented. A pseudo-quality term  $x_2$  and a correlating equation can be devised that may be applied to both subcritical and near-critical (above critical pressure) fluid states, enabling correlation across the saturation dome.

Preliminary results from a test section with axial heat-flux gradients, simulating the rocket-cooling-channel environment, showed a minimum heat-transfer coefficient in the vicinity of the maximum heat flux.

Lewis Research Center,  
National Aeronautics and Space Administration,  
Cleveland, Ohio, October 27, 1965.



## APPENDIX A

## SYMBOLS

A	area, sq ft
$A_l, A_g$	area fractions, dimensionless
B	resistivity intercept
$a_i, b_i, c_i, d_i$	polynomial coefficients (see appendix B for values)
$C_p$	specific heat at constant pressure, Btu/(lb mass)(°R)
d	diameter, in. or ft
E	energy
G	mass flux, lb mass/(sq ft)(sec)
g	gravitational acceleration
H	enthalpy, Btu/lb mass
$\Delta H$	enthalpy difference, Btu/lb
h	local heat-transfer coefficient, Btu/(sq in.)(sec)(°R) or Btu/(sq ft)(sec)(°R)
I	current, A
k	thermal conductivity, Btu/(ft)(sec)(°R)
$k_m$	thermal conductivity of test section, Btu/(hr)(ft)(°R)
L	length, in.
$\Delta L$	increment of length, in.
M	sensitivity slope, (see eq. (B3))
m	Reynolds number exponent (eq. (B25))
Nu	Nusselt number, $hd/k$
P	pressure, psia
p	$T_w/T_b$ term exponent
Pr	Prandtl number, $C_p\mu/k$
Q	heat input, Btu/sec
$\Delta Q$	heat increment, Btu/sec
$\left(\frac{\Delta Q}{\Delta L}\right)_{TC}$	local heat input across thermocouple, Btu/(in.)(sec)
q	heat flux, Btu/(sq in.)(sec) or Btu/(sq ft)(sec)

Re	Reynolds number, $\rho u d / \mu$
r	radius, in.
Sr	Stermann parameter, $(q \Delta V) / (u_b \Delta H)$
T	temperature, °R
T*	transposed critical temperature
t	temperature, °R
u	velocity, ft/sec
$u_{\perp}$	velocity normal to surface, ft/sec
$\bar{u}_{\perp}$	superficial velocity normal to surface, ft/sec
V	specific volume, cu ft/lb
$\Delta V$	volume difference, cu ft/lb
$V_t$	test section voltage, V
$\dot{w}$	mass flow, lb/sec
x	quality
$x_2$	distribution function, pseudo quality
Y	correlating parameter, table IX
Z	$PV/RT$ or $\rho_{pg}/\rho_{equil}$
$\delta Q$	incremental input of heat up to station under calculation from previous station, Btu/sec
$\lambda$	enthalpy change of vaporization, Btu/lb
$\mu$	viscosity, lb/(ft)(sec)
$\nu$	kinematic viscosity, $\mu/\rho$ , sq ft/sec
$\rho$	density, lb/cu ft
$\rho_e$	electrical resistivity, ohm-circ-mils/ft
$X_{tt}$	Martinelli parameter (see eq. (B14))
$X_{tt,x}$	Martinelli parameter based on x

Subscripts:

b	bulk condition
calc	calculated value
crit	critical value

exp experimental  
 f film conditions, arithmetic mean between wall and bulk temperature  
 fm mean film conditions (e.g., see eq. (4))  
 fr freezing  
 g gas or low-density conditions  
 i inside surface of test section (also subscripts on coefficients)  
 in inlet conditions  
 l liquid or heavy-density conditions  
 max maximum value  
 N dummy index (number of stations)  
 o outside  
 pg perfect gas properties  
 s reference value  
 sat saturated condition  
 STA station location  
 TC across thermocouple  
 t total length of heated section  
 tot total (used in  $k_{tot} = k_f A_f + k_l A_l$ )  
 w wall conditions  
 v defined in table VIII

APPENDIX B

COMPUTATIONAL PROCEDURE

Inside-Wall Temperature

The inside-wall temperatures were computed from the following expression, which presupposes uniform radial heat flux through the tube wall which is generating power

$$\left(\frac{\Delta Q}{\Delta L}\right)_{TC} \frac{\text{Const}}{2\pi} = \int_{T_i}^{T_o} k_m(t) dt = \int_{T_s}^{T_o} k_m(t) dt - \int_{T_s}^{T_i} k_m(t) dt \quad (B1)$$

where

$$\text{Const} = \frac{4.32 \times 10^4 \left[ r_o^2 \ln\left(\frac{r_o}{r_i}\right) - \left(\frac{r_o^2 - r_i^2}{2}\right) \right]}{r_o^2 - r_i^2} \quad (B2)$$

and  $T_s$  is some reference temperature. Machine interpolation of integral tables or interrogation of a curve fit of  $\int k_m(t) dt$  will yield the inside wall temperature.

The value of  $(\Delta Q/\Delta L)_{TC}$  is obtained from an iterative procedure involving  $T_i$ , electrical resistivity  $\rho_e(t)$ , and the heat balance over the length of the test section

$$\left(\frac{\Delta Q}{\Delta L}\right)_{TC} = \frac{0.000948 \times I^2 \rho_e(t)}{48 \times 10^6 (r_o^2 - r_i^2)} \quad (B3)$$

where  $\rho_e(t)$  is based on the arithmetic mean of  $T_o$  and  $T_i$

$$\rho_e(t) = M \left( \frac{T_o + T_i}{2} \right) + B$$

Nominal values of M and B are:

Material	Slope, M, $\frac{\text{ohm-circ-mils}}{(\text{ft})(^\circ\text{R})}$	Resistivity intercept, B, $\frac{\text{ohm-circ-mils}}{\text{ft}}$
Stainless	0.25	290
Inconel	.04	590

Because of power measurement errors, and the low sensitivity of  $\rho_e(t)$  to temperature changes, the value of  $M$  was considered correct and the value of the intercept  $B$  was determined on the basis of the average wall temperature and the heat input:

$$B = 48 \times 10^6 (r_o^2 - r_i^2) \left( \frac{V_t}{11L_t} \right) - \frac{M}{N} \sum_0^N \left( \frac{T_o + T_i}{2} \right) \quad (B4)$$

This procedure (eq. (B1)) may be deduced from the more general equation of heating a pipe:

$$\frac{1}{k_m} \frac{\partial k_m}{\partial t} \left( \frac{\partial t}{\partial r} \right)^2 + \frac{1}{r} \frac{\partial t}{\partial r} + \frac{\partial^2 t}{\partial r^2} = \frac{\text{Const}}{\rho_e(t) k_m(t)} \left( \frac{\Delta V_t}{\Delta L} \right)^2 \quad (B5)$$

However, even a finite-difference solution to equation (B5) requires an iteration over the length to obtain the effects of resistance variations. It may be further noted that when  $\rho_e(t)$  and  $\Delta V/\Delta L$  are constant, equation (B5) reduces to equation (B1).

#### Bulk Properties

Bulk properties for the supercritical pressure regime were obtained from subroutine STATE (ref. 13). The properties for the subcritical pressure regime were obtained from subroutine STATE and an updated property package made primarily from reference 12.

The procedure to determine the local bulk temperature requires the inlet enthalpy, the heat addition to the station under computation, and the pressure at that point. The inlet enthalpy is obtained by calling subroutine STATE with pressure and temperature at the inlet. A call on subroutine STATE then determines the bulk temperature:

$$H(P_b, T_b)_{STA} = H(P, T)_{in} + \frac{\sum_0^{STA} \delta Q}{\dot{w}} \quad (B6)$$

For the subcritical regime, the bulk temperature was obtained in an iterative manner by using specific heat (see ref. 12). Once the bulk temperature, pressure, and enthalpy are known, the remaining bulk properties such as density, specific heat, velocity of sound, etc. may be obtained by proper storage interrogation on the same call. A second call on subroutine STATE with density and temperature returns the desired transport properties. The definitions of

$\sum_0^{STA} \delta Q$  and  $\Delta Q_{TC}$  differ in that the former is the heat addition from the

inlet to the station under calculation, while the latter is the local heat input across the station.

#### Distribution Function (Pseudo-Quality)

Once the bulk properties have been established, the distribution of light and heavy species may be determined (see ref. 15 for additional background). The heavy species density is assumed to be described by

$$\rho(\text{heavy species}) = \rho_l = A(P_b)T_b^3 + B(P_b)T_b^2 + C(P_b)T_b + D(P_b) \quad (\text{B7})$$

subject to the conditions

$$\rho_l = \rho_{fr} = \rho_b \quad \text{at } (T, P)_{fr} \quad (\text{B8a})$$

$$\rho_l = \rho_g = \rho_b \quad \text{at } (T, P)_{Z=1} \quad (\text{B8b})$$

$$\frac{d\rho_l}{dt} = \frac{d\rho_b}{dt} \quad \text{at } (T, P)_{fr} \quad (\text{B8c})$$

$$\frac{d\rho_l}{dt} = \frac{d\rho_g}{dt} \quad \text{at } (T, P)_{Z=1} \quad (\text{B8d})$$

The data used to determine the curve fit for these conditions were modified just slightly in order to obtain a better fit near 40° R without obtaining negative values of  $x_2$  in between; further modification to the curve fit assures a smooth transition near  $Z = 1$ .<sup>3</sup>

The coefficients in the cubic equations are functions of pressure and may be fitted subject to the conditions of equations (B7) and (B8).

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<sup>3</sup>Improved thermodynamic data and state equations should enable one to match the conditions to the degree of accuracy required to have  $x_2 \rightarrow 0$  as  $\rho_2 \rightarrow \rho_{melt}$  and  $x_2 \rightarrow 1$  as  $\rho_2 \rightarrow \rho_{pg}$ .

The values used in this report are

$$\begin{aligned}
 A(P_b) &= \left( \sum_{i=0}^4 a_i P_b^i \right) \times 10^{-5} & a_4 &= -9.7E-14 \\
 & & a_3 &= 2.30045E-10 \\
 & & a_2 &= -1.443816E-07 \\
 & & a_1 &= 8.1783531E-05 \\
 & & a_0 &= 9.7123649E-02 \\
 \\
 B(P_b) &= \left( \sum_{i=0}^4 b_i P_b^i \right) \times 10 & b_4 &= 3.43E-13 \\
 & & b_3 &= -7.90679E-10 \\
 & & b_2 &= 5.5397169E-07 \\
 & & b_1 &= -2.878265E-04 \\
 & & b_0 &= -2.29942E-01 \\
 \\
 C(P_b) &= \sum_{i=0}^4 c_i P_b^i & c_4 &= -1.8E-14 \\
 & & c_3 &= 4.2446E-11 \\
 & & c_2 &= -3.23586E-08 \\
 & & c_1 &= 2.321711E-05 \\
 & & c_0 &= -1.902559E-02 \\
 \\
 D(P_b) &= \sum_{i=0}^1 d_i P_b^i & d_1 &= 6.5763047E-06 \\
 & & d_0 &= 5.41887E-00
 \end{aligned} \tag{B9}$$

Thus, the pseudo-quality or distribution function becomes

$$x_2 = \left( \frac{\rho_{pg}}{\rho_b} \right) \left( \frac{\rho_l - \rho_b}{\rho_l - \rho_{pg}} \right) \tag{B10a}$$

Note that  $\rho_{pg}/\rho_b = Z$  and  $0 < x_2 < 1$  (see also eq. (B11)). An analogy to quality, expressed in terms of density, is apparent:

$$\begin{aligned}
 \frac{1}{\rho_b} &= \frac{x}{\rho_{sat,g}} + \frac{1-x}{\rho_{sat,l}} \\
 x &= \frac{\rho_{sat,g}}{\rho_b} \left( \frac{\rho_{sat,l} - \rho_b}{\rho_{sat,l} - \rho_{sat,g}} \right)
 \end{aligned} \tag{B10b}$$

To determine  $x_2$  for the subcritical-pressure regime, the bulk density must be a known quantity. Within the two-phase region the bulk density is given by equation (B10b) and elsewhere  $\rho = \rho(P,T)$ .

The matching of the end conditions near  $Z = 1$ , as specified by equation (B8) did not work as well as desired; thus, a cutoff point was determined, and a more reasonable distribution function was then determined by a slope-intercept technique. Temperature at cutoff equals  $(-0.0443 P_b + 158)$ . For temperatures beyond this value, the pseudo-quality becomes

$$x_2 = M(P_b)T_b + B(P_b) \tag{B11}$$

where

$$\left. \begin{aligned} B(P_b) &= \sum_{i=0}^4 a_i P_b^i \\ M(P_b) &= \sum_{i=0}^4 b_i P_b^i \end{aligned} \right\} \quad (B12)$$

$$\begin{aligned} a_4 &= -0.11247577E-11 & b_4 &= 0.36166297E-16 \\ a_3 &= 0.15071394E-08 & b_3 &= 0.93537951E-11 \\ a_2 &= -0.15870883E-05 & b_2 &= -0.22592206E-08 \\ a_1 &= -0.62177482E-04 & b_1 &= 0.33818447E-05 \\ a_0 &= 0.98422723E-00 & b_0 &= -0.55408367E-04 \end{aligned}$$

A plot of  $x_2$  is included as figure 11 (p. 20). Inspection of equation (B10a) indicates that the definition of  $x_2$  must be confined to  $Z \leq 1$ , and  $\rho_l > \rho_{pg}$  as stated in reference 15.

#### Area Fractions

The area fraction represents the ratio of surface area exposed to a species to the total surface area. The fractions defined in reference 15 are modified and restated as follows:

$$\left. \begin{aligned} A_l &= \frac{(1 - x_2)}{\rho_l} \rho_{fm} \\ A_g &= \frac{x_2}{\rho_f} \rho_{fm} = (1 - A_l) \end{aligned} \right\} \quad (B13)$$

where

$$\frac{1}{\rho_{fm}} = \frac{x_2}{\rho_f} + \frac{1 - x_2}{\rho_l}$$

#### Martinelli Parameter

The Martinelli parameter, which assumes coaxial flow of a heavy and light species, was modified in reference 12 and used in the same manner herein:

$$x_{tt} = \left( \frac{1 - x_2}{x_2} \right)^{0.9} \left( \frac{\rho_f}{\rho_l} \right)^{0.5} \left( \frac{\mu_l}{\mu_f} \right)^{0.1} \quad (B14)$$



## Transverse Heat Transport

The interchange process of heavy species approaching the wall and the light species being ejected from the wall is analogous to a jet of fluid toward and away from the wall. A parameter  $q/\lambda\rho u$  encompassing this analog was proposed for subcritical boiling by Stermann (ref. 22). If one assumes that the wall ejects uniformly,  $q/\lambda\rho$  may be interpreted as a superficial transverse velocity  $\bar{u}_\perp$ . Dividing by the local bulk velocity gives a ratio  $\bar{u}_\perp/u_b$ , which may be regarded as the penetration length parameter of the light species into the heavy. In the boiling case,  $\lambda$  has been shown to have a significant influence on the surface temperature, and represents the exchange of energy at the wall; hence, the enthalpy difference of heavy species to light species could be analogous to  $\lambda$  for the supercritical-pressure state.

Two simplified approaches to defining the supercritical enthalpy difference are presented. Assume that the Clapeyron equation may be extended into the supercritical-pressure regime, where  $T^*(P)$  (transposed critical temperature) is an extension of  $T(P)_{\text{sat},\lambda}$ . Using  $T^*$  instead of  $T_{\text{sat}}$  in the Clapeyron-Clausius equation gives the extended relation

$$\frac{dp}{dT^*} = \frac{\lambda'}{T^* \Delta V} \quad (\text{B15})$$

As  $\lambda'$  is some equivalent heat of vaporization or energy change, let  $\Delta H$  represent this change, or

$$\Delta H = \lambda' = \frac{T^* \Delta V}{\frac{dT^*}{dp}} \quad (\text{B16})$$

But  $T^* = f(P)$  is nearly linear over the range of pressures covered herein; hence,  $\Delta H$  becomes

$$\Delta H = (\text{Const})T^* \Delta V = (\text{Const})T^* \left( \frac{1}{\rho_g} - \frac{1}{\rho_l} \right)$$

A second method of obtaining  $\lambda'$  would simply be the difference between the enthalpy at some reference temperature and the bulk enthalpy:

$$\Delta H = H_s - H_b \quad (\text{B17})$$

Reference conditions could be film or reference enthalpy.

As the previously formulated parameters involve a superficial transverse velocity  $\bar{u}_\perp$ , one seeks to determine the local transverse velocity  $u_\perp$ . The superficial velocity and the local velocity differ by the heat-transfer surface area used to determine each:

$$\frac{u_\perp}{u_b} = \frac{\bar{u}_\perp}{A_g u_b} \quad (\text{B18})$$

To determine this area distribution of the light or gas species  $A_g$ , the least-energy principle was applied to the flux of heavy species toward the wall and the light species away from the wall.

The energy to volume ratio in the vicinity of the wall may be expressed as

$$\frac{\text{Energy}}{\text{Volume}} = \frac{\text{Const} \left( \frac{1}{2} \dot{w}_l u_l^2 + \frac{1}{2} \dot{w}_g u_g^2 \right)}{A_l u_l + A_g u_g} = \frac{\frac{\text{Const}}{2} \left[ \left( \frac{\dot{w}^3}{\rho^2 A^2} \right)_l + \left( \frac{\dot{w}^3}{\rho^2 A^2} \right)_g \right]}{\left( \frac{\dot{w}}{\rho} \right)_l + \left( \frac{\dot{w}}{\rho} \right)_g} \quad (\text{B19})$$

Now if influx is equal to outflux,

$$\dot{w}_l = \dot{w}_g \quad (\text{B20a})$$

and

$$A_l = 1 - A_g \quad (\text{B20b})$$

Minimizing the energy to volume ratio with respect to the heavy species area fraction gives

$$\left. \begin{aligned} \frac{\partial(E/V)}{\partial A_l} &= 0 \\ \left( \frac{\dot{w}^3}{\rho^2 A^3} \right)_l + \left( \frac{\dot{w}^3}{\rho^2 A^3} \right)_g &= 0 \end{aligned} \right\} \quad (\text{B21})$$

Substituting these conditions (eqs. (B20a) and (B20b)) into equation (B21) gives the surface fraction influenced by the light species:

$$\frac{1}{A_g} = 1 + \left( \frac{\rho_g}{\rho_l} \right)^{2/3} \quad (\text{B22})$$

Thus, a generalized expression for the ratio of the transverse velocity to the bulk velocity using the modified Stermann parameter, becomes

$$\frac{u_\perp}{u_b} = \frac{\bar{u}_\perp}{A_g u_b} = \frac{q \left( \frac{1}{\rho_g} - \frac{1}{\rho_l} \right)}{u_b (\Delta H)_s} \left[ 1 + \left( \frac{\rho_g}{\rho_l} \right)^{2/3} \right] \quad (\text{B23})$$

where  $i = 1, 2$  either of the previously formulated  $\Delta H$  values (or others), and subscripts  $g$  and  $l$  refer to the light and heavy species, respectively.

The insertion of a parameter similar to equation (B23) into the Dittus-Boelter equation should enhance the heat transfer when  $u_l/u_b$  is high and becomes ineffective when fully developed flow is attained, that is, low  $u_l/u_b$ . One method of incorporating this modification into the Dittus-Boelter type equation is to assert that the effective Nusselt number is the sum of the transverse and axial Nusselt relations. Thus, one of the many possible ratios of experimental to calculated Nusselt parameters becomes

$$\frac{Nu_{exp}}{Nu_{calc} \left[ 1 + \left( \frac{u_l}{u_b} \right) \text{Const} \right]} = f(x_{tt}) \quad (\text{B24})$$

Such a parametric grouping reported herein was the result of a combination of equations (B23) and (B24) with some further modifications. This correlation presented in figure 12 grouped the data quite well. The ordinate of the figure is

$$\frac{Nu_{exp, tot}}{Nu_{calc}} = \frac{Nu_{exp, tot} \left( \frac{u_b^2}{gd} \right)^{0.1}}{0.021 \left( \frac{\rho_{fm} u_b d}{\mu_f} \right)^m Pr_f^{0.4} \left\{ 1 + 15 \left( \frac{p_b}{p_{crit}} \right)^{0.4} \left[ 1 + \left( \frac{\rho_f}{\rho_b} \right)^{2/3} \right] \frac{g}{\rho_f u_b (H_f - H_b)} \right\}} \quad (\text{B25})$$

To obtain  $m$ , it was assumed that the power on the Reynolds number should vary as the simple  $(1/m)^{\text{th}}$  power law:

$$\frac{u_b}{u_{max}} = \left( \frac{y}{r} \right)^{1/m}$$

To relate this variation to mean velocity or bulk velocity, reference 25 gives

$$\frac{u_b}{u_{max}} = \frac{2m^2}{(2m+1)(m+1)}$$

and a set of graphs to determine

$$\frac{u_b}{u_{max}} = f(\text{Re})$$

or

$$m = f(\text{Re})$$

The expression  $\text{Re}_{fm}$  was assumed to describe the flow, and the curve fit for  $m$  yields

$$m = \exp\left(\left\{\left[(A \ln \text{Re}_{fm} + B) \ln \text{Re}_{fm} + C\right] \ln \text{Re}_{fm} + D\right\} \ln \text{Re}_{fm} + E\right)$$

where

$$A = 1.244874 \times 10^{-4}$$

$$B = -3.63492 \times 10^{-3}$$

$$C = 3.457557 \times 10^{-2}$$

$$D = -4.911898 \times 10^{-2}$$

$$E = 1.297074$$

Eckert Parameter

This parameter was suggested by Eckert (ref. 26) for correlating supercritical heat-transfer data. It failed to correlate the hydrogen data presented in reference 15. However, trends in the data indicate that this or a similar parameter should have merit; thus, it is included in the machine output

$$\frac{T^* - T_B}{T_W - T_B} = \frac{T^* - T_b}{T_W - T_b}$$

where, for the range of pressured covered,

$$T^* = 0.0443 P_b + 52$$

## APPENDIX C

### PARA-HYDROGEN PROPERTY CHARTS

In this appendix, property curves (figs. 18 to 23) computed from reference 13, are presented to aid the reader in both visualizing the near-critical property changes and the performance of manual calculations. The property curves presented are for

- (1) Specific heat
- (2) Thermal conductivity
- (3) Density
- (4) Interim viscosity of para-hydrogen
- (5) Viscosity based on normal hydrogen
- (6) Fluid properties ratio  $\left( c_p^{0.4} k^{0.6} / \mu^{0.4} \right)$

Subroutine STATE (ref. 13) should be used for programing heat-transfer calculations on a high-speed computer. On the other hand, if very accurate PVT relations are required, reference 10 should be used. In the vicinity of the critical point, curve fits may be required.

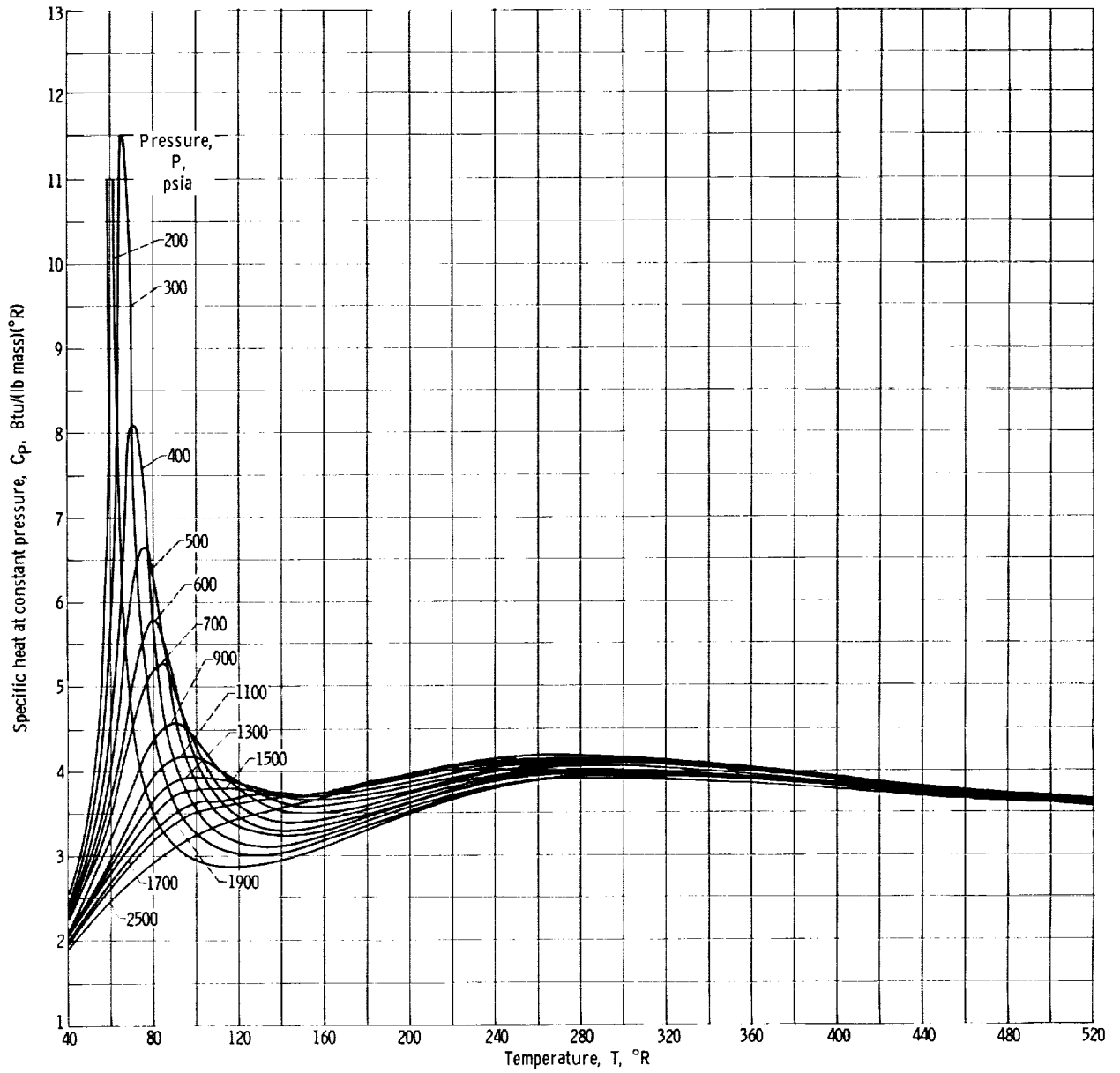


Figure 18. - Specific-heat data for para-hydrogen (computed from ref. 13).

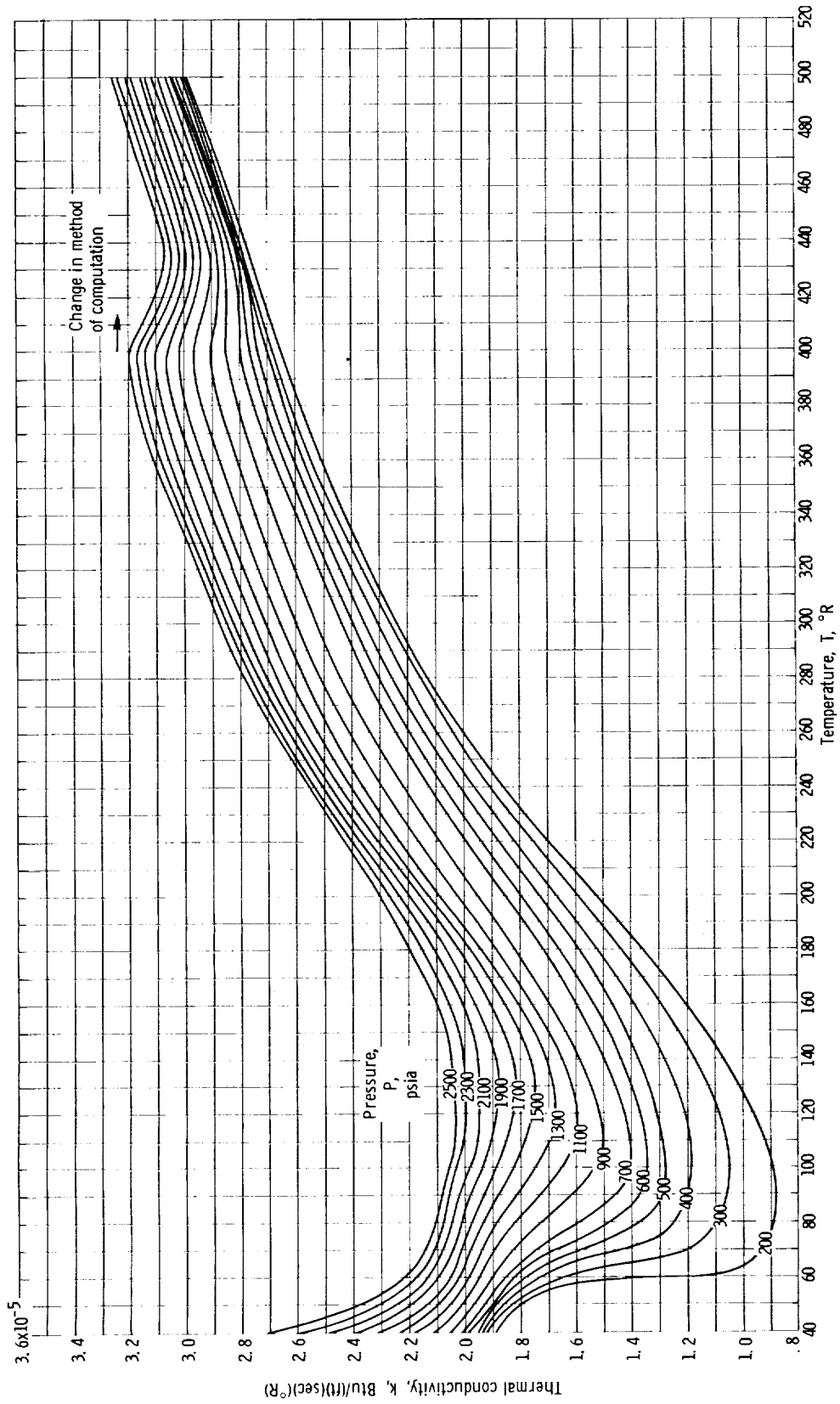


Figure 19. - Thermal conductivity of hydrogen from reference 13.

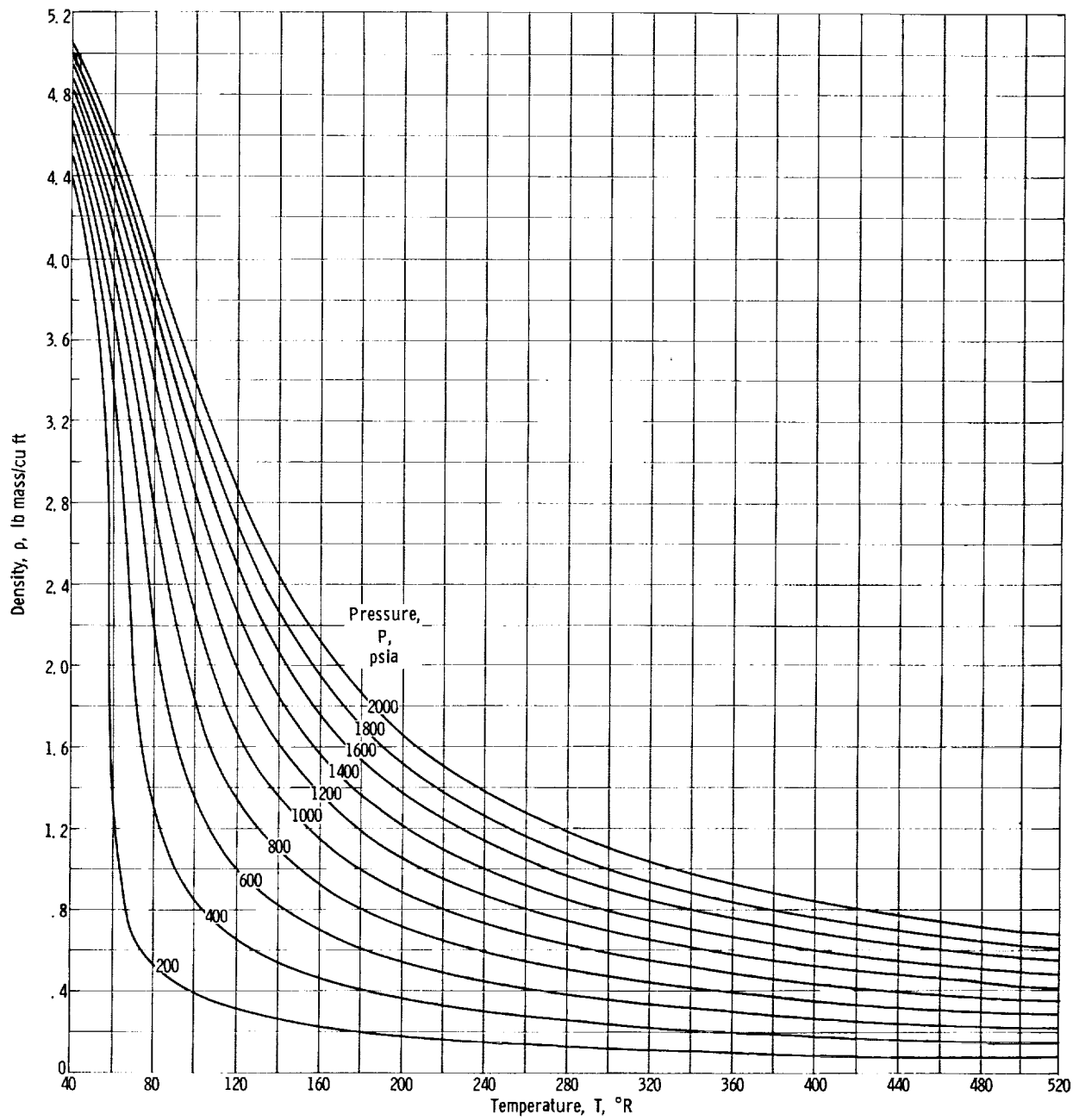


Figure 20. - Density of para-hydrogen from reference 13.



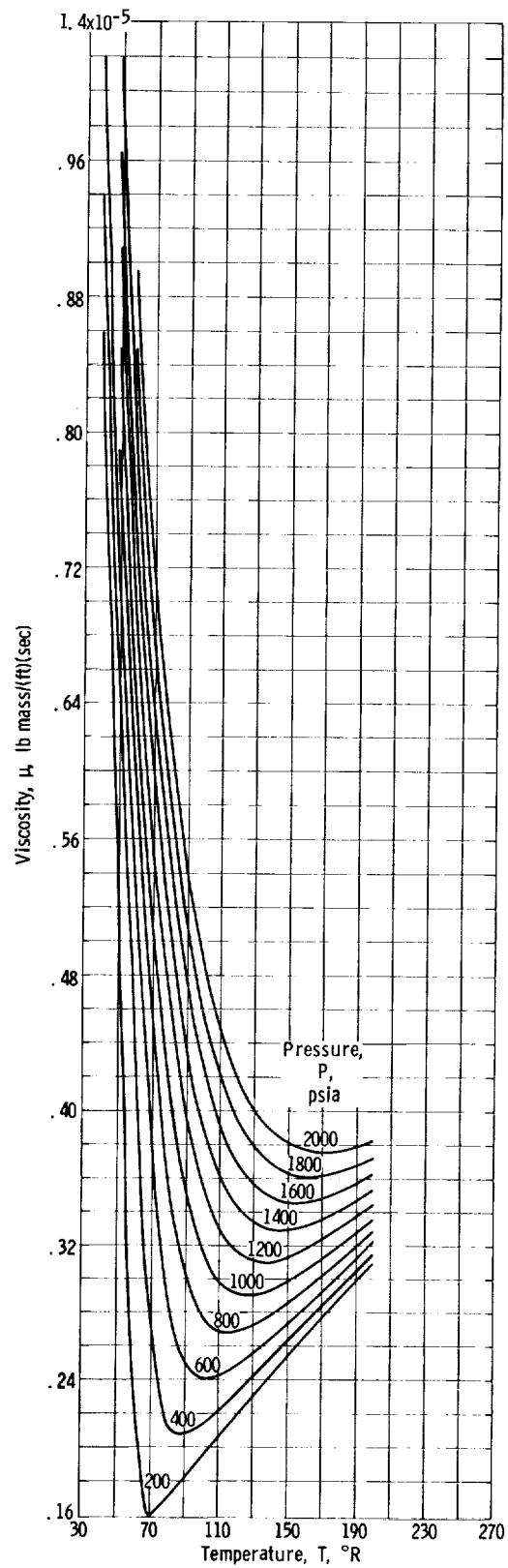


Figure 21. - Viscosity of para-hydrogen from reference 13 (based on ref. 14).

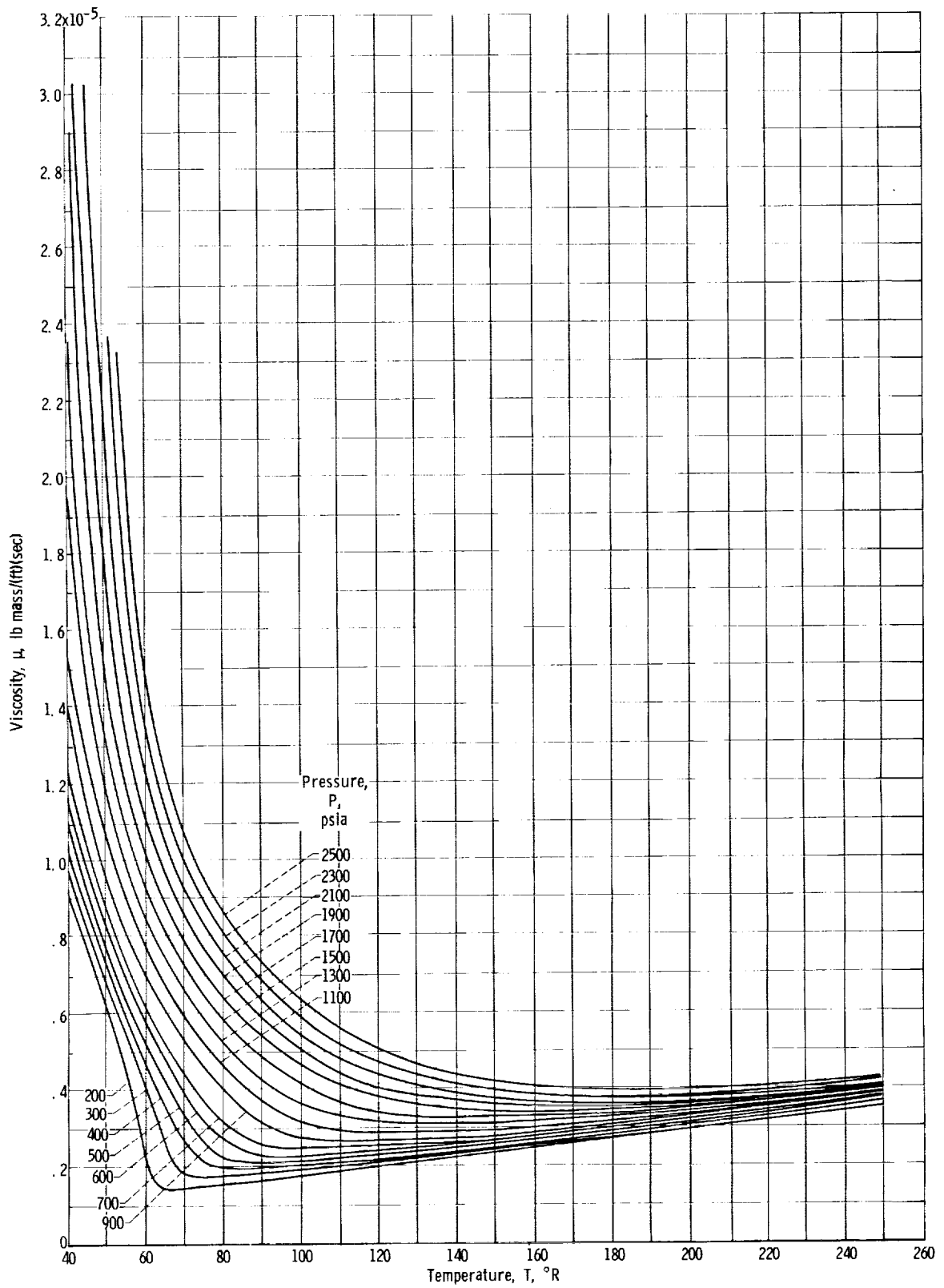


Figure 22. - Viscosity of hydrogen computed from reference 13 (based on ref. 29).

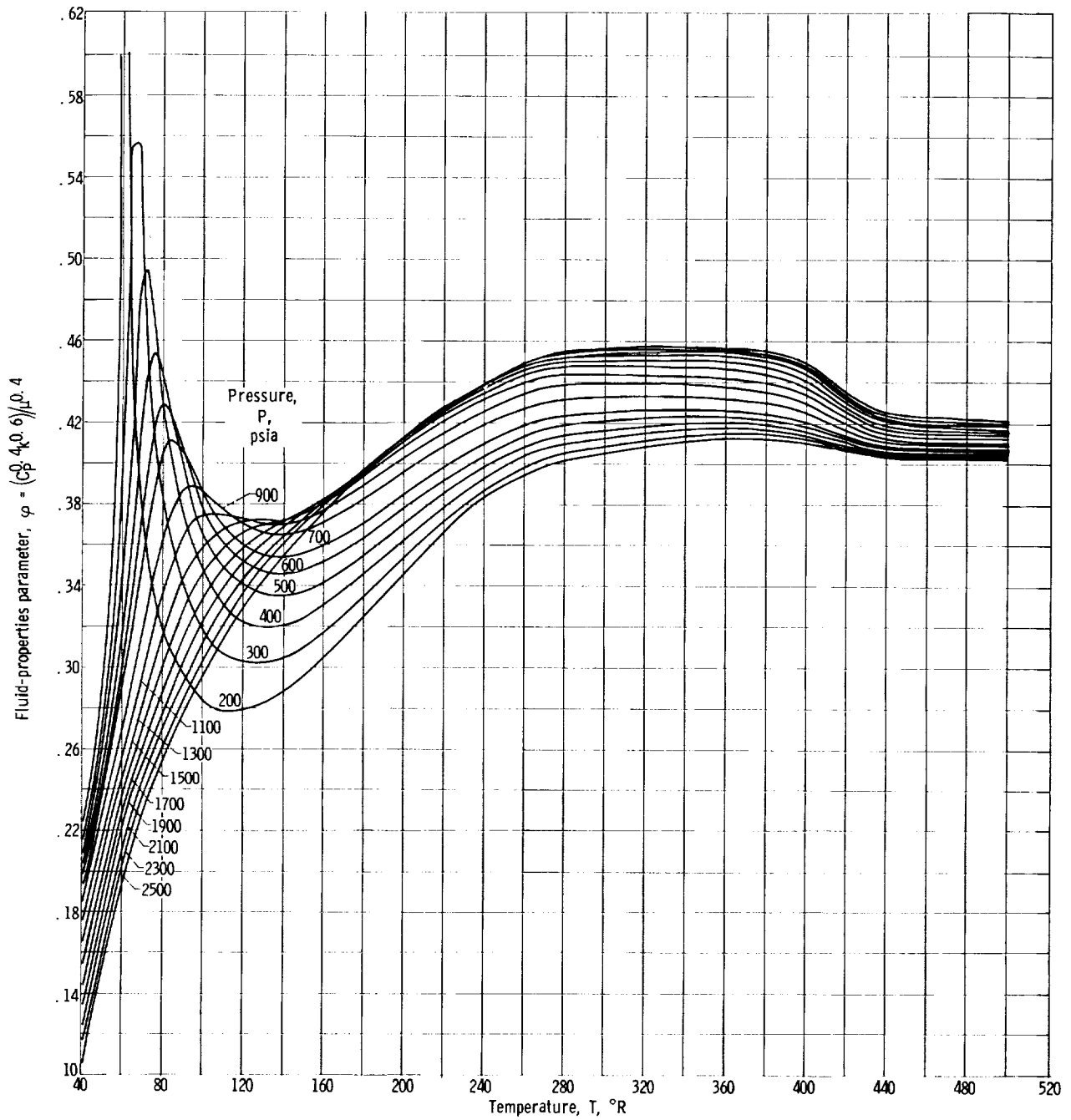


Figure 23. - Fluid-properties parameter associated with Nussett equation.

## APPENDIX D

### ACCURACY OF DATA - TABLES IV TO VII

#### Temperature

The local surface temperatures were obtained by thermocouple thermometry. The thermocouples were electrically isolated from the potential of the test section in most runs; if they were not electrically isolated, they were carefully positioned to reduce pickup due to test-section electrical potential. The lead wires were wrapped at least one revolution about the test section to eliminate temperature gradients at the junction. For the initial runs, a liquid-nitrogen reference junction was used; subsequent measurements, however, utilized an ice reference, which was considered more accurate because its temperature was closer to the terminal board junction temperature. Thus, neglecting minor line and junction temperature gradients, the thermocouple accuracy was limited only by the standard calibration and final recording system accuracy.

The inlet and exit bulk temperatures and pressures were metered in mixing chambers or areas of low velocity and high turbulence. Platinum resistance thermometers, utilized above 90° R, and carbon resistance thermometers, used below 139° R, were estimated to have less than 1 percent probable error. The carbon and platinum thermometers were checked for compatibility in liquid nitrogen prior to running. Gas inlet temperatures were metered by a thermocouple in the gas transfer line rather than in the mixing chamber, and gas inlet temperatures were not as accurately known as liquid inlet temperatures.

#### Pressure

The local static pressures were obtained through hypodermic taps at the test section connected to 1/8- to 1/4-inch-diameter transition tubing leading to transducers. The response of this system was low, but all measurements were essentially steady state. Commercial transducers with a maximum 1-percent full-scale nonlinearity were used; since readings were confined to half scale on oversized transducers, errors from this source are estimated at 2 percent. All static and differential transducers were calibrated by using nitrogen gas pressure and 1/2-percent-error Bourdon tube gages.

#### Heat Input

Heat input is a direct function of the power-supply output and test-section resistance. The meters used to measure volts and amperes were accurate within 1 percent for any waveform, except for runs prior to XXX-X400 in table IV. These runs were corrected by using a correlation between measured power and true power. Because of wall temperature variation throughout the test section (in addition to minor effects of aging, mechanical strain, and contact resistance at the connectors), the absolute value of the test-section resistance was considered no better than 10-percent accurate, although the resistance change with

temperature could be estimated to within 5 percent.

### Flow

The flow rate was metered by a venturi at the bottom of the Dewar and an orifice in the vent line downstream of a heat exchanger. The fluid at the venturi was assumed to be in an equilibrium state, and changes in the fluid properties and motion could be monitored by measuring Dewar static pressure, venturi bulk temperature, and pressure drop. At the orifice, the fluid was a near-perfect gas, and changes in properties and motion were computed from orifice temperature, static pressure, and pressure-drop measurements. The accuracy of bulk temperature and pressure discussed before applies to these measurements; in addition, pressure transducer accuracies were within 1 percent because they were operated near full scale at the flow-metering stations.

### Recording System

All the measurements reported in table IV, except for heat input, were recorded on a digital potentiometer of 1/4 percent probable error, well within the static accuracy of the measuring systems. Measurements were also monitored by an oscillograph (3-percent error) and self-balancing potentiometers ( $1\frac{1}{2}$ -percent error).

### Flow and Pressure Fluctuations

Oscillations in the gaseous pressurizing system were amplified by a regulator, and these oscillations in turn induced some flow fluctuations. In addition, the lines from the flowmeters to the transducers contained liquid, cold gas, and warm gas at some locations, leading to additional oscillations from this source. The flow and pressure oscillations were generally cyclic and uniform; nevertheless they were detrimental to precise flow control and accurate static- and differential-pressure measurements. The digital potentiometer recording system, which recorded about 20 points per second, balanced out at each data word in about 16 milliseconds. By repeating data recording over 7 to 10 cycles and averaging the results, "steady-state" flow rates were calculated to within 3 to 5 percent accuracy. Once established, inlet steady-state pressure levels could be maintained to within about 2 percent.

### Temperature Fluctuations

The direct-current power supply was manually controlled from an observed voltage output signal. At power levels below 30 volts, the observed voltage fluctuated as much as  $\pm 2$  volts during a 1-minute run, but at power levels above 30 volts, fluctuations were confined to  $\pm 1/2$  volt.

Local static pressure measurements were affected by the power-supply fluctuations in addition to the pressure and flow oscillations. Differential pres-

sure measurements were most sensitive to these oscillations; however, time-averaging gave values considered accurate to within  $\pm 10$  percent for differential pressure and  $\pm 5$  percent for static pressure.

The fluctuations in voltage, pressure, and flow also caused characteristic time variations in surface temperature. The low-frequency (1/2 to 4 cps) variations, were time-average to a steady-state value, while the higher frequency noise, due to electrical pickup and other sources, was filtered from the direct-current thermocouple signal.

#### Precision of Data

Throughout the program, every effort was made to eliminate sources of error, and all measurements were simultaneously checked by two sources. Weight flow was measured by three meters (the previously mentioned venturi and orifice, plus a second venturi primarily for use with the flow controller) all of which agreed to within 3 percent. Bulk temperatures, measured by independent carbon or platinum resistance thermometers, agreed to within  $\pm 2^{\circ}$  R at the inlet and  $\pm 10^{\circ}$  R at the exit. Pressure measurements on the test section compared differential-pressure values against differences of static-pressure values. Agreement here was generally to within 20 percent of the differential-pressure values, which corresponded to an uncertainty of only 1 percent in the absolute static pressure. Surface temperatures were checked by a comparison of thermocouples attached by different techniques and the use of additional thermocouples circumferentially and longitudinally. Measured values usually agreed to within  $\pm 10^{\circ}$  R. Power measurements were checked by dual sets of voltmeters and ammeters, originating from independent shunts or taps. Further checks were made by computing the tube resistance from measured volts and amperes and comparing this value with the tube resistance predicted from independent bridge measurements. Agreement here was generally within 5 percent, although it is conceded that the probable error for power measurement was greater than for any other measurement.

While this satisfactory degree of data precision implies a corresponding confidence in static accuracy, the inaccuracies from dynamic errors cannot be estimated from the static data precision. Reproducibility of a data point, while necessary, is not sufficient to assure accuracy.

## APPENDIX E

### DIRECTORY FOR TABLE IV AND SYMBOLS FOR TABLES IV TO VII

As an aid in locating runs corresponding to specific supercritical operating conditions in table IV, a directory (table III) is included. It is divided into five sets of runs at different inside and outside diameters and test-section length, which, in turn are subdivided by pressure range. For each range a grid is divided into blocks at intervals of mass flow  $\dot{w}$  and heat input  $Q$ . Run numbers are given within this matrix in the blocks that include the  $\dot{w}$  and  $Q$  values of the run. Each test section includes runs for

- (1) Inlet bulk temperature below  $T_{crit}$  ( $\sim 59^\circ R$ ), inlet pressure 200 to 300 pounds per square inch absolute
- (2) Inlet bulk temperature below  $T_{crit}$ , inlet pressure 300 to 500 pounds per square inch absolute
- (3) Inlet bulk temperature below  $T_{crit}$ , inlet pressure 500 pounds per square inch absolute and above
- (4) Inlet bulk temperature near and above  $T_{crit}$  at all inlet pressures

Subcritical, axial heat-flux gradient, and gaseous data in tables V to VII are much less extensive than the supercritical data of table IV. No directory is included for these tables, but runs corresponding to specific operating conditions should be readily located.

### SYMBOLS FOR TABULATIONS (TABLES IV TO VII)

#### MACHINE OUTPUT KEY

Symbol	Description	Dimensions
RUN XXX-XXXX	run number, XXX represents chronological order and XXXX represents reference number	-----
WEIGHT FLOW or OMEGA	tank venturi measurement	lb mass/sec
HEAT INPUT or BIGQ	total heat input to test section	Btu/sec
INLET BULK TEMP	average inlet bulk temperature	$^\circ R$
OUTLET BULK TEMP	average outlet bulk temperature	$^\circ R$

Symbol	Description	Dimensions
HEAT BALANCE or HEAT BAL	$\frac{\text{Electrical heat input} - \text{Enthalpy rise}}{\text{Electrical heat input}}$ $= \frac{Q - \Delta H}{Q}$	-----
TEST VOLTAGE or VOLTS or VOLTS DROP	voltage measured between electrical flanges	V
HEAT INPUT/UNIT AREA	average heat flux (q)	$\frac{\text{Btu}}{(\text{sq in.})(\text{sec})}$
ID	inside diameter	in.
OD	outside diameter	in.
LENGTH or ELT	length of heated test section	in.
PLOT CH	character on machine plot that represents run (plots have been omitted herein)	-----
EL	axial station location	in.
PB	bulk static pressure	psia
TB	bulk total temperature	$^{\circ}\text{R}$
ROB	bulk density	lb mass/cu ft
VELOC	bulk velocity (average)	ft/sec
M	Mach number	-----
X2	distribution function, pseudo quality	-----
TO	external surface temperature	$^{\circ}\text{R}$
TW	inside wall temperature	$^{\circ}\text{R}$
H	experimental heat-transfer coefficient	$\frac{\text{Btu}}{(\text{sq in.})(\text{sec})(^{\circ}\text{R})}$
H/HHK	ratio of experimental h to calcu- lated h by method of refer- ence 21 (see also table VIII)	-----



Symbol	Description	Dimensions
H/HMW	heat-transfer coefficient ratio calculated by method of reference 20 (see table VIII)	-----
H/HF	heat-transfer-coefficient ratio calculated based on film properties of reference 17 (see table VIII)	-----
TW/TB	wall to bulk temperature ratio	-----
THETA	Eckert parameter (ref. 25), $(T^* - T_b)/(T_w - T_b)$	-----
ROFM	mean film density (eq. (4)), $\rho_{fm}$	lb mass/cu ft
RE-B	Reynolds number (bulk properties)	-----
RE-F	Reynolds number (film properties)	-----
RE-F, MN	Reynolds number (mean film) used in eq. (B25), $(\rho_{fm}ud)/(\mu_f)$	-----
PR-B	Prandtl number (bulk properties)	-----
PR-F	Prandtl number (film properties)	-----
XTTF	Martinelli parameter (film properties), $\left(\frac{1 - x_2}{x_2}\right)^{0.9} \left(\frac{\rho_f}{\rho_l}\right)^{0.5} \left(\frac{\mu_l}{\mu_f}\right)^{0.1}$	-----
VIS-RAT	kinematic viscosity ratio (wall to bulk), $(\nu_w/\nu_b)$	-----
PHI-B	heat-transfer parameter (bulk), $(C_P^{0.4}k^{0.6}/\mu^{0.4})_b$	$\frac{\text{Btu}}{(^{\circ}\text{R})(\text{lb}^{0.8})(\text{ft}^{0.2})(\text{sec}^{0.2})}$
PHI-F	heat-transfer parameter (film), $(C_P^{0.4}k^{0.6}/\mu^{0.4})_f$	$\frac{\text{Btu}}{(^{\circ}\text{R})(\text{lb}^{0.8})(\text{ft}^{0.2})(\text{sec}^{0.2})}$
EFLUX	wall efflux to bulk velocity ratio, eq. (B24)	-----
DQDL	local heat flux (based on resistivity variations)	Btu/(sq in.)(sec)

Symbol	Description	Dimensions
H/H-H	ratio of experimental h to calculated h by reference enthalpy method (ref. 27; see appendix F)	-----
SIMPLE	single-phase correlation parameter of reference 28	lb <sup>0.8</sup> /(sec <sup>0.8</sup> )(ft <sup>1.8</sup> )
NU/NU <sub>T</sub>	ratio of Nusselt numbers based on x <sub>2</sub> , total thermal conductivity, and mean film density (see eq. (1))	-----
TOLK	total thermal conductivity, $k_f A_f + k_l A_l$	Btu/(sec)(ft)(°R)
H/HSIMPLE	ratio of experimental h to calculated h by method of ref. 28 (see Discussion)	-----
XTT <sub>SUB</sub>	Martinelli parameter, $\left(\frac{1-x}{x}\right)^{0.9} \left(\frac{\rho_f}{\rho_l}\right)^{0.5} \left(\frac{\mu_l}{\mu_f}\right)^{0.1}$	-----
XTT <sub>SUP</sub>	Martinelli parameter, XTT <sub>F</sub> at subcritical pressure	-----
Y <sub>SUB</sub>	Nu <sub>exp, f</sub> /Nu <sub>calc, fm</sub> (see eq. (13))	-----
Y <sub>SUP</sub>	Nu <sub>exp, tot</sub> /Nu <sub>calc, fm</sub> (see eq. (14))	-----
H/HSUB	ratio of experimental h to h predicted by eq. (13)	-----
H/HSUP	ratio of experimental h to h predicted by eq. (14)	-----

TABLE III. - DIRECTORY FOR TABLE IV

(a) Test section 1; tube inside diameter, 0.507 inch; tube outside diameter, 0.527 inch; heated tube length, 24 inches.

Weight flow, w, lb/sec	Heat input, Q, Btu/sec										
	10	15	20	25	30	35	40	45	50	55	>55
Pressure range, 200 to 300 psia											
<0.07											
.07											
.09	7-1085			5-1090		2-1098					
.11											
.13											
.15				6-1088		3-1094					
.17											
.19						4-1093					
.21											
Pressure range, 300 to 500 psia											
<0.07											
.07											
.09						8-1097					
.11											
.13											
.15			16-1099	14-1089		11-1101					
.17											
.19		18-1087		15-1091							
.21											
Pressure range, >500 psia											
<0.07											
.07											
.09				20-1092							
.11											
.13											
.15	21-1086					19-1116					
.17											
.19											
.21											
Pressure range, $T_{in} > T_{crit}$											
<0.07											
.07		32-1108				22-1111					
.09		33-1104				23-1165 26-1110					
.11		35-1103									
.13		36-1106				29-1168					
.15											
.17											
.19											
.21											

TABLE III. - Continued. DIRECTORY FOR TABLE IV

(b) Test section 2; tube inside diameter, 0.438 inch; tube outside diameter, 0.502 inch; heated tube length, 24 inches.

Weight flow, w, lb/sec	Heat input, Q, Btu/sec										
	10	15	20	25	30	35	40	45	50	55	>55
Pressure range, 300 psia											
<0.07											
.07											
.09									3-1207		
.11		11-1188				10-1202					
.13											1-1210
.15											
.17											2-1212
.19							9-1192				
.21											
Pressure range, 600 psia											
<0.07											
.07											
.09							16-1205				13-1215
.11							17-1218				
.13		22-1190									14-1214
.15											
.17							19-1217				15-1213
.19											
.21											
Pressure range, $T_{in} > T_{crit}$											
<0.07											
.07				26-1241							
.09				27-1239					23-1245		
.11											
.13				28-1240							
.15									25-1244		
.17											
.19											
.21											

TABLE III. - Continued. DIRECTORY FOR TABLE IV

(c) Test section 3; tube inside diameter, 0.335 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches.

Weight flow, $\dot{w}$ , lb/sec	Heat input, Q, Btu/sec										
	10	15	20	25	30	35	40	45	50	55	>55
Pressure range, 200 to 300 psia											
<0.07											
.07											
.09						14-702			4-888		
.11											
.13		26-287				15-640				1-880	
.15		27-288									
.17		28-681				16-700				3-877	
.19											
.21											
Pressure range, 300 to 500 psia											
<0.07											
.07											
.09					43-688			30-886			
.11											
.13		55-258			45-649			32-312			
.15											
.17		56-259									
.19					47-653			34-273			
.21											
Pressure range, >500 psia											
<0.07											
.07											
.09					66-661						
.11			77-635		68-660						
.13										57-881	
.15			79-687								
.17						64-706				60-710	
.19				75-666							
.21											
Pressure range, $T_{in} > T_{crit}$											
<0.07		103-315	95-301	92-303							
.07		105-671	96-673		87-304						
.09		106-299	100-670	94-294	89-678	85-298		81-891			
.11			101-366					83-892	80-889		
.13			102-367				84-368				
.15											
.17											
.19											
.21											

TABLE III. - Continued. DIRECTORY FOR TABLE IV

(d) Test section 4; tube inside diameter, 0.22 inch; tube outside diameter, 0.251 inch; heated tube length, 18 inches.

Weight flow, $\dot{w}$ , lb/sec	Heat input, Q, Btu/sec										
	10	15	20	25	30	35	40	45	50	55	>55
Pressure range, 200 to 300 psia											
<0.07											
.07											
.09	8-1044					2-1005					
.11											
.13	9-1043		4-1007			3-1022					
.15											
.17	10-1042		5-1006								
.19											
.21											
Pressure range, 300 to 500 psia											
<0.07											
.07											
.09	19-1012					11-1026					
.11											
.13			17-1011			14-1025					
.15											
.17	20-1036					16-1024					
.19											
.21											
Pressure range, >500 psia											
<0.07											
.07											
.09		28-1048				22-1029					
.11											
.13											
.15		30-1038				24-1027					
.17											
.19											
.21											
Pressure range, $T_{in} > T_{crit}$											
<0.07											
.07		39-1017				33-1035					
.09		41-1019				34-1032					
.11						36-1031					
.13		44-1020				37-1033					
.15											
.17											
.19											
.21											

TABLE III. - Concluded. DIRECTORY FOR TABLE IV

(e) Test section 5; tube inside diameter, 0.188 inch; tube outside diameter, 0.25 inch; heated tube length, 24 inches.

Weight flow, W, lb/sec	Heat input, Q, Btu/sec										
	10	15	20	25	30	35	40	45	50	55	>55
Pressure range, 200 to 300 psia											
<0.07											
.07											
.09		4-569									
.11											
.13				1-574							
.15											
.17											
.19											
.21											
Pressure range, 300 to 500 psia											
<0.07											
.07						7-244					
.09			18-489					5-586			
.11	22-487				12-492	8-849		6-850			
.13			20-902			9-245					
.15											
.17											
.19											
.21											
Pressure range, >500 psia											
<0.07											
.07											
.09						28-606		23-858			
.11								24-851			
.13						30-608					
.15		42-582									
.17											
.19						32-901					
.21											
Pressure range, $T_{in} > T_{crit}$											
<0.07											
.07		66-508	60-503	49-592				44-871			
.09	75-497	70-519	61-507	53-521				45-865			
.11	76-498	72-517	63-502	55-614				46-870			
.13			65-500	57-523							
.15				58-527							
.17	77-528										
.19											
.21											





## APPENDIX F

### EXPERIMENTAL HYDROGEN HEAT-TRANSFER DATA IN SUPERCRITICAL AND SUBCRITICAL REGIONS - TABLES IV TO VII

The following tables present the experimental hydrogen heat-transfer data obtained in this investigation, including both measured variables and calculated parameters. Table IV contains the uniformly heated supercritical-pressure runs; table V, the uniformly heated subcritical-pressure runs; table VI, the axial heat-flux-gradient runs; and table VII, the ambient temperature gaseous runs.

The column headings are defined in appendix E. Ratios of experimental to calculated heat-transfer coefficients by the correlations introduced in the text are included in the tables. Three parameters, not otherwise discussed in the text, are also included in the tables since they offer some promise of other groupings or correlations of the data. These parameters are

- H/H-H      ratio of experimental to calculated heat-transfer coefficients by a reference-enthalpy method (see ref. 27 for a definition and discussion of this parameter)
- SIMPLE      simplified single-phase correlation parameter of reference 28, defined as  $G^{0.8} d^{-0.2} \sqrt{T_b/T_w}$
- THETA      Eckert parameter (ref. 26), a ratio that signifies the approach to the transposed critical temperature (see appendix B for definition)

TABLE IV. - UNIFORMLY HEATED

(a) Test section 1; tube inside diameter, 0.507 inch; tube outside

EL	PB	TB	ROB	VELOC	M	X2	TD	TW	H	H/HHK	H/HMW	H/AF	Ta/TB	THETA	ROFM
RUN	2-1098	WEIGHT FLOW,	0.0876	HEAT INPUT,	35.02	INLET BULK TEMP,	55.1	OUTLET BULK TEMP,	150.6	PLOT CH 3					
2.50	261.0	61.5	2.777	22.5	0.012	0.0933	341.	314.	0.00357	6.96	1.87	2.30	5.11	0.008	1.66
4.50	260.6	63.6	2.079	30.1	0.020	0.2024	359.	333.	0.00336	5.08	1.38	7.05	5.23	-0.000	0.96
6.50	260.1	65.7	1.518	41.2	0.028	0.3568	407.	381.	0.00267	3.40	1.44	4.87	5.83	-0.007	0.95
8.50	259.7	69.5	1.132	55.2	0.036	0.5231	465.	440.	0.00245	2.38	1.66	3.47	6.33	-0.016	0.34
9.50	259.5	72.3	0.992	63.0	0.040	0.5988	528.	503.	0.00212	1.92	1.66	2.89	6.95	-0.021	0.27
10.50	259.3	75.7	0.878	71.2	0.043	0.6660	558.	533.	0.00200	1.72	1.70	2.58	7.03	-0.027	0.23
11.50	259.1	79.6	0.785	79.6	0.046	0.7236	586.	561.	0.00190	1.57	1.73	2.32	7.05	-0.034	0.20
13.50	258.7	88.7	0.645	96.9	0.052	0.8117	657.	634.	0.00168	1.31	1.70	1.92	7.14	-0.046	0.16
15.50	258.3	99.1	0.546	114.6	0.058	0.8711	775.	753.	0.00141	1.10	1.57	1.64	7.60	-0.055	0.13
17.50	257.9	110.2	0.473	132.3	0.063	0.9106	767.	745.	0.00145	1.09	1.58	1.51	6.76	-0.074	0.12
19.50	257.4	121.3	0.419	149.3	0.068	0.9354	842.	821.	0.00133	0.98	1.44	1.35	6.76	-0.083	0.11
21.50	257.0	132.7	0.376	166.3	0.072	0.9544	838.	816.	0.00136	0.97	1.39	1.28	6.15	-0.101	0.10
RUN	3-1094	WEIGHT FLOW,	0.1464	HEAT INPUT,	35.31	INLET BULK TEMP,	53.3	OUTLET BULK TEMP,	92.1	PLOT CH 4					
2.50	268.5	58.6	3.286	31.3	0.013	0.0489	341.	313.	0.00359	5.36	1.71	6.90	5.35	0.021	2.34
4.50	268.1	61.3	2.879	36.3	0.018	0.0844	342.	315.	0.00361	4.74	1.34	6.27	5.14	0.010	1.78
6.50	267.6	63.0	2.452	42.6	0.025	0.1320	362.	335.	0.00337	3.79	0.97	5.24	5.32	0.003	1.27
8.50	267.2	64.1	2.042	51.2	0.033	0.2146	389.	362.	0.00308	2.94	0.90	4.22	5.65	-0.001	0.88
9.50	267.0	64.7	1.858	56.2	0.037	0.2583	413.	386.	0.00286	2.57	0.87	3.71	5.97	-0.003	0.73
10.50	266.8	65.4	1.690	61.8	0.042	0.3059	439.	413.	0.00265	2.16	0.87	3.27	6.32	-0.004	0.60
11.50	266.6	66.1	1.538	67.9	0.046	0.3559	456.	430.	0.00253	1.92	0.91	2.94	6.50	-0.006	0.51
13.50	266.2	68.2	1.283	81.4	0.054	0.4578	510.	484.	0.00222	1.49	0.98	2.35	7.10	-0.011	0.37
15.50	265.8	71.1	1.085	96.3	0.061	0.5549	592.	568.	0.00187	1.16	0.97	1.92	7.98	-0.015	0.27
17.50	265.4	75.0	0.931	112.3	0.068	0.6414	607.	582.	0.00183	1.07	1.06	1.70	7.77	-0.022	0.23
19.50	264.9	79.5	0.810	129.0	0.075	0.7143	653.	629.	0.00169	0.94	1.08	1.49	7.91	-0.029	0.19
21.50	264.5	84.8	0.715	146.1	0.081	0.7735	664.	640.	0.00168	0.89	1.11	1.35	7.55	-0.038	0.17
RUN	4-1093	WEIGHT FLOW,	0.1946	HEAT INPUT,	35.03	INLET BULK TEMP,	50.1	OUTLET BULK TEMP,	73.0	PLOT CH 5					
2.50	242.4	54.8	3.594	38.6	0.014	0.0272	321.	293.	0.00381	5.34	1.69	6.71	5.35	0.033	2.86
4.50	241.9	57.7	3.304	42.0	0.018	0.0432	320.	292.	0.00387	4.99	1.42	6.40	5.67	0.021	2.42
6.50	241.4	59.8	2.995	46.4	0.023	0.0662	332.	305.	0.00370	4.32	1.14	5.75	5.10	0.012	1.95
8.50	240.9	61.2	2.668	52.1	0.029	0.0980	345.	318.	0.00354	3.67	0.87	5.06	5.20	0.006	1.52
9.50	240.6	61.6	2.499	55.6	0.034	0.1201	417.	391.	0.00278	2.57	0.85	3.98	6.34	0.003	1.19
10.50	240.4	61.9	2.329	59.6	0.038	0.1449	390.	364.	0.00302	2.68	0.62	4.00	5.87	0.002	1.09
11.50	240.1	62.2	2.166	64.1	0.042	0.1726	440.	414.	0.00260	2.09	0.57	3.40	6.65	0.001	0.88
13.50	239.6	62.8	1.864	74.5	0.052	0.2355	468.	442.	0.00242	1.70	0.55	2.87	7.34	-0.001	0.65
15.50	239.1	63.5	1.599	86.9	0.061	0.3035	539.	513.	0.00204	1.26	0.56	2.31	8.08	-0.002	0.46
17.50	238.6	64.6	1.375	101.0	0.071	0.3875	564.	539.	0.00194	1.10	0.64	2.01	8.35	-0.004	0.36
19.50	238.1	66.1	1.191	116.6	0.080	0.4671	613.	589.	0.00177	0.93	0.69	1.73	8.91	-0.007	0.28
21.50	237.6	68.2	1.041	133.4	0.089	0.5436	597.	572.	0.00183	0.91	0.76	1.59	8.39	-0.011	0.25
RUN	5-1090	WEIGHT FLOW,	0.0815	HEAT INPUT,	22.70	INLET BULK TEMP,	57.4	OUTLET BULK TEMP,	106.6	PLOT CH 6					
2.50	282.7	61.9	2.872	20.3	0.010	0.0894	260.	242.	0.00327	6.62	1.70	7.93	3.91	0.015	2.02
4.50	282.4	63.9	2.390	24.4	0.015	0.1559	279.	261.	0.00300	5.23	1.23	6.47	4.09	0.003	1.42
6.50	282.2	65.4	1.944	29.9	0.019	0.2477	277.	259.	0.00305	4.54	1.24	5.58	3.96	-0.005	1.04
8.50	281.9	67.2	1.576	36.9	0.024	0.3571	319.	302.	0.00252	3.24	1.21	4.11	4.49	-0.011	0.70
9.50	281.8	68.4	1.423	40.9	0.027	0.4148	307.	289.	0.00268	3.22	1.35	3.96	4.23	-0.018	0.64
10.50	281.7	69.8	1.290	45.1	0.029	0.4718	335.	318.	0.00239	2.68	1.35	3.37	4.55	-0.021	0.53
11.50	281.6	71.5	1.174	49.6	0.031	0.5268	412.	394.	0.00184	1.91	1.24	2.56	5.52	-0.022	0.40
13.50	281.3	75.7	0.987	59.0	0.036	0.6270	367.	349.	0.00217	2.05	1.47	2.54	4.51	-0.041	0.38
15.50	281.1	80.9	0.844	69.0	0.040	0.7106	505.	489.	0.00147	1.27	1.27	1.73	6.03	-0.040	0.25
17.50	280.8	87.0	0.735	79.2	0.043	0.7770	447.	430.	0.00174	1.39	1.45	1.74	4.94	-0.066	0.25
19.50	280.6	93.8	0.649	89.7	0.047	0.8281	515.	498.	0.00148	1.14	1.35	1.45	5.91	-0.073	0.21
21.50	280.3	101.1	0.581	100.2	0.050	0.8671	560.	543.	0.00136	1.02	1.37	1.30	5.37	-0.083	0.18
RUN	6-1088	WEIGHT FLOW,	0.1458	HEAT INPUT,	23.23	INLET BULK TEMP,	52.4	OUTLET BULK TEMP,	70.2	PLOT CH 7					
2.50	259.7	56.3	3.501	29.7	0.012	0.0339	254.	235.	0.00338	5.47	1.57	6.40	4.18	0.041	2.89
4.50	259.4	58.7	3.243	32.1	0.014	0.0504	256.	239.	0.00335	5.07	1.34	6.03	4.08	0.027	2.51
6.50	259.2	60.5	2.972	35.0	0.017	0.0728	274.	255.	0.00311	4.36	1.09	5.36	4.22	0.015	2.09
8.50	258.9	61.8	2.689	38.7	0.021	0.1026	286.	267.	0.00294	3.78	0.86	4.78	4.33	0.008	1.71
9.50	258.8	62.3	2.545	40.9	0.024	0.1215	287.	269.	0.00293	3.59	0.78	4.56	4.32	0.006	1.54
10.50	258.7	62.7	2.400	43.4	0.027	0.1429	311.	293.	0.00263	3.05	0.67	4.02	4.58	0.003	1.33
11.50	258.6	63.0	2.258	46.1	0.029	0.1668	317.	299.	0.00257	2.83	0.65	3.76	4.74	0.002	1.18
13.50	258.3	63.7	1.991	52.3	0.035	0.2198	335.	318.	0.00239	2.37	0.63	3.22	4.94	-0.001	0.93
15.50	258.1	64.5	1.751	59.4	0.040	0.2802	385.	370.	0.00199	1.73	0.55	2.51	5.74	-0.003	0.68
17.50	257.8	65.4	1.541	67.6	0.046	0.3464	409.	391.	0.00187	1.49	0.62	2.17	5.99	-0.006	0.55
19.50	257.6	66.5	1.360	76.5	0.052	0.4150	452.	434.	0.00166	1.19	0.65	1.81	6.53	-0.009	0.43
21.50	257.3	68.1	1.207	86.2	0.057	0.4828	460.	442.	0.00163	1.09	0.70	1.63	6.50	-0.013	0.37
RUN	7-1085	WEIGHT FLOW,	0.0253	HEAT INPUT,	12.34	INLET BULK TEMP,	58.6	OUTLET BULK TEMP,	70.1	PLOT CH 8					
2.50	244.7	60.5	2.887	21.1	0.011	0.0767	207.	196.	0.00237	4.90	1.03	5.68	3.24	0.019	2.21
4.50	244.4	61.5	2.622	23.2	0.013	0.1056	202.	192.	0.00247	4.67	0.86	5.42	3.12	0.010	1.72
6.50	244.2	62.1	2.352	25.9	0.016	0.1433	227.	217.	0.00208	3.77	0.63	4.54	3.49	0.005	1.52
8.50	243.9	62.6	2.094	29.1	0.019	0.1886	225.	210.	0.00206	3.42	0.64	4.12	3.50	0.001	1.27
9.50	243.8	62.9	1.973	30.9	0.021	0.2136	251.	241.	0.00181	2.90	0.59	3.60	3.84	-0.009	1.10
10.50	2														

SUPERCRITICAL PRESSURE RUNS

diameter, 0.527 inch; heated tube length, 24 inches; material, Inconel X

RE-B	RE-F	RE-F,MN	PR-6	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFJUX	UQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.03 TEST VOLTAGE, 50.3 HEAT INPUT/UNIT AREA, 0.913 ID, 0.507 OD, 0.527 LENGTH, 24.0														
841426.	86279.	550801.	2.172	0.665	2.1894	23.115	0.5247	0.3392	0.04938	0.90	2.378	22.8	1.95	1.59
1174805.	104994.	409914.	3.084	0.671	0.9453	26.625	0.6777	0.3494	0.03897	0.90	2.364	22.5	2.31	1.60
1422460.	116784.	295039.	1.915	0.680	0.4378	29.634	0.5865	0.3721	0.02889	0.91	2.218	21.4	2.32	1.76
1544069.	125077.	227649.	1.019	0.686	0.2220	31.354	0.4560	0.3929	0.02130	0.91	2.008	20.5	2.17	1.97
1563716.	116091.	187482.	0.841	0.687	0.1582	34.828	0.4152	0.4051	0.01876	0.91	1.818	19.5	1.98	2.17
1562159.	119086.	174498.	0.737	0.676	0.1174	33.955	0.3840	0.4073	0.01988	0.91	1.715	19.4	1.91	2.26
1544361.	121846.	165291.	0.774	0.685	0.0920	32.793	0.3609	0.4094	0.01411	0.91	1.618	19.4	1.83	2.34
1478297.	121070.	147486.	0.616	0.683	0.0571	31.631	0.3268	0.4145	0.01133	0.92	1.414	19.3	1.65	2.53
1394122.	106255.	121112.	0.599	0.695	0.0367	33.681	0.3064	0.4057	0.00934	0.92	1.214	18.7	1.48	2.74
1308759.	121523.	132699.	0.600	0.696	0.0273	26.966	0.2752	0.4053	0.00820	0.92	1.146	19.8	1.41	2.75
1231708.	116271.	123611.	0.610	0.693	0.0204	26.460	0.2942	0.4036	0.00722	0.93	1.027	19.8	1.30	2.89
1161655.	127686.	132244.	0.620	0.693	0.0167	22.252	0.2758	0.4036	0.00655	0.93	0.977	20.8	1.24	2.91
HEAT BALANCE, 0.00 TEST VOLTAGE, 50.2 HEAT INPUT/UNIT AREA, 0.920 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1044891.	127400.	1097867.	1.508	0.663	4.1359	19.664	0.3318	0.3380	0.03291	0.91	1.602	33.6	1.09	1.66
1328108.	142370.	949978.	1.942	0.664	2.4433	22.129	0.4894	0.3401	0.03022	0.92	1.591	34.3	1.26	1.61
1659863.	151515.	765663.	3.074	0.670	1.4328	26.161	0.6435	0.3508	0.02626	0.92	1.556	33.7	1.38	1.63
1986031.	101363.	608750.	2.841	0.677	0.8589	29.776	0.6580	0.3647	0.02227	0.92	1.509	32.7	1.45	1.70
2126173.	160764.	529624.	2.664	0.680	0.6685	32.367	0.6526	0.3740	0.02017	0.92	1.463	31.8	1.43	1.77
2248741.	159723.	461748.	2.311	0.683	0.5235	35.306	0.6248	0.3832	0.01822	0.92	1.408	30.9	1.41	1.86
2351985.	165064.	421096.	1.871	0.684	0.4191	36.349	0.5799	0.3889	0.01660	0.92	1.377	30.5	1.41	1.92
2499235.	164580.	338939.	1.243	0.687	0.2703	33.425	0.4959	0.4039	0.01362	0.92	1.276	29.1	1.33	2.11
2574973.	152027.	264291.	0.930	0.685	0.1766	44.871	0.4370	0.4095	0.01116	0.93	1.143	27.5	1.25	2.32
2592355.	168588.	256215.	0.768	0.684	0.1270	40.518	0.3949	0.4107	0.00955	0.93	1.098	27.9	1.23	2.37
2569857.	170229.	234071.	0.682	0.683	0.0915	39.819	0.3641	0.4140	0.00831	0.93	1.016	27.6	1.16	2.50
2569571.	165436.	336436.	0.636	0.682	0.0697	35.431	0.3414	0.4145	0.00739	0.93	0.973	28.3	1.12	2.53
HEAT BALANCE, -0.04 TEST VOLTAGE, 50.0 HEAT INPUT/UNIT AREA, 0.912 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1145385.	157578.	1719174.	1.348	0.659	7.0305	17.565	0.3149	0.3239	0.02884	0.91	1.333	42.1	0.80	1.68
1376723.	169513.	1573049.	1.536	0.660	4.5782	19.332	0.3920	0.3247	0.02743	0.91	1.317	43.3	0.90	1.62
1659414.	173501.	1360313.	1.909	0.664	2.9854	22.754	0.4710	0.3318	0.02557	0.91	1.291	43.2	0.98	1.59
1991405.	161570.	1161680.	2.777	0.669	1.9735	26.176	0.5434	0.3393	0.02333	0.91	1.271	42.7	1.07	1.58
2173097.	143270.	857809.	3.808	0.682	1.4638	37.750	0.6959	0.3727	0.02108	0.91	1.145	38.7	0.95	1.77
2359205.	170326.	879842.	4.552	0.679	1.2477	33.928	0.7681	0.3625	0.02035	0.91	1.198	40.2	1.06	1.69
2539561.	151058.	703752.	4.203	0.684	0.9697	42.806	0.7604	0.3809	0.01845	0.91	1.119	37.8	1.00	1.84
2865017.	158400.	581991.	3.833	0.686	0.6603	47.136	0.7565	0.3905	0.01574	0.92	1.087	36.8	1.03	1.94
3136372.	147007.	435301.	2.811	0.687	0.4385	56.939	0.6827	0.4045	0.01335	0.92	1.005	34.3	0.99	2.15
3343947.	157903.	382938.	1.801	0.687	0.3126	56.805	0.5780	0.4063	0.01154	0.92	0.978	33.7	1.00	2.22
3486720.	158601.	325419.	1.269	0.685	0.2232	59.540	0.5022	0.4098	0.00971	0.92	0.926	32.7	0.99	2.35
3570298.	198210.	335083.	0.967	0.686	0.1725	50.876	0.4487	0.4088	0.00888	0.92	0.929	33.7	1.01	2.32
HEAT BALANCE, 0.04 TEST VOLTAGE, 39.9 HEAT INPUT/UNIT AREA, 0.592 ID, 0.507 OD, 0.527 LENGTH, 24.0														
740773.	121524.	689933.	1.669	0.633	2.7032	13.494	0.4829	0.3095	0.03443	0.59	1.844	24.6	1.62	1.50
947830.	130017.	559942.	2.708	0.643	1.4764	16.271	0.6265	0.3180	0.03004	0.59	1.828	24.1	1.80	1.45
1139632.	159735.	504370.	2.403	0.643	0.8809	15.745	0.6688	0.3180	0.02584	0.59	1.893	24.4	2.07	1.39
1281855.	157411.	384490.	1.753	0.660	0.5114	18.572	0.5626	0.3377	0.02117	0.59	1.765	23.0	1.97	1.49
1332186.	184034.	396149.	1.407	0.656	0.4199	16.233	0.5187	0.3322	0.01979	0.59	1.831	23.6	2.11	1.45
1369059.	176329.	343311.	1.157	0.666	0.3262	17.737	0.4805	0.3469	0.01768	0.59	1.719	22.8	1.96	1.55
1393745.	141124.	252749.	0.986	0.681	0.2413	23.641	0.4490	0.3798	0.01504	0.59	1.471	20.7	1.62	1.83
1412051.	176611.	299855.	0.784	0.675	0.1782	16.403	0.4009	0.3650	0.01363	0.59	1.584	22.6	1.81	1.69
1398694.	139401.	191448.	0.682	0.686	0.1090	25.068	0.3666	0.4056	0.01035	0.60	1.212	19.8	1.35	2.17
1364610.	188264.	237399.	0.631	0.685	0.0864	17.218	0.3419	0.3965	0.00959	0.60	1.282	21.9	1.45	2.02
1318917.	158355.	201623.	0.607	0.686	0.0618	18.834	0.3240	0.4070	0.00808	0.60	1.111	21.1	1.27	2.23
1267909.	164184.	187307.	0.597	0.684	0.0468	18.705	0.3109	0.4103	0.00707	0.60	1.006	21.0	1.18	2.35
HEAT BALANCE, 0.02 TEST VOLTAGE, 40.5 HEAT INPUT/UNIT AREA, 0.606 ID, 0.507 OD, 0.527 LENGTH, 24.0														
910059.	177529.	1901347.	1.382	0.631	6.6244	11.671	0.3505	0.3007	0.02402	0.60	1.197	37.9	0.83	1.63
1069227.	184047.	1384297.	1.557	0.635	4.5308	13.091	0.4024	0.3035	0.02301	0.60	1.188	38.3	0.91	1.56
1256591.	180891.	1260711.	1.856	0.644	3.0840	15.745	0.4688	0.3112	0.02168	0.60	1.164	37.7	0.96	1.52
1469237.	185366.	1061260.	2.417	0.650	2.1438	18.049	0.5586	0.3172	0.02016	0.60	1.152	37.2	1.03	1.49
1583121.	193788.	1010911.	2.960	0.650	1.6055	18.580	0.6237	0.3181	0.01938	0.61	1.158	37.3	1.08	1.47
1699760.	181071.	876663.	3.489	0.659	1.4615	21.776	0.6828	0.3292	0.01831	0.61	1.119	35.8	1.05	1.51
1814827.	186969.	821079.	3.467	0.661	1.2289	22.584	0.6952	0.3319	0.01742	0.61	1.117	35.6	1.08	1.51
2026466.	193445.	705691.	3.077	0.667	0.8763	24.651	0.6833	0.3417	0.01554	0.61	1.093	34.7	1.10	1.54
2208678.	175457.	541175.	2.716	0.679	0.6079	30.579	0.6641	0.3677	0.01340	0.61	1.006	32.3	1.02	1.72
2357528.	182863.	475376.	2.034	0.681	0.4480	31.594	0.6003	0.3753	0.01180	0.61	0.977	31.6	1.01	1.79
2470361.	176786.	335945.	1.491	0.685	0.3276	35.770	0.5341	0.3901	0.01021	0.61	0.916	30.3	0.96	1.94
2548562.	192605.	377228.	1.158	0.686	0.2541	33.015	0.4823	0.3932	0.00916	0.61	0.901	30.4	0.96	1.98
HEAT BALANCE, 0.09 TEST VOLTAGE, 29.0 HEAT INPUT/UNIT AREA, 0.322 ID, 0.507 OD, 0.527 LENGTH, 24.0														
773121.	149506.	884979.	2.079	0.619	3.2372	10.929	0.3018	0.2924	0.02076	0.32	1.082	28.0	1.00	1.45
892985.	169463.	856853.	2.923	0.619	2.3991	11.048	0.6114	0.2920	0.01961	0.32	1.121	28.5	1.12	1.38
1021553.	157663.	712246.	4.279	0.629	1.6437	13.933	0.7467	0.2953	0.01814	0.32	1.081	27.0	1.12	1.34
1145256.	173672.	663566.	3.820	0.630	1.2160	14.163	0.7379	0.2957	0.01672	0.32	1.105	26.9	1.22	1.30
1202088.	160747.	576031.	3.702	0.641	1.0079	16.494	0.7381	0.3039	0.01576	0.32	1.058	25.7	1.16	1.32
1255354.	162955.	539789.	3.577	0.645	0.8653	17.115								

TABLE IV. - Continued. UNIFORMLY

(a) Continued. Test section 1; tube inside diameter, 0.507 inch; tube outside

EL	PB	Tb	ROB	VELOC	M	X2	TD	TW	H	H/HHK	H/HMW	H/HF	L4/TB	THETA	ROFM
RUN	8-1097	WEIGHT FLOW,	0.0928	HEAT INPUT,	35.55	INLET BULK TEMP,	56.0	OUTLET BULK TEMP,	147.3	PLOT CH 9					
2.50	473.6	65.2	3.185	20.8	0.008	0.0930	319.	292.	0.00407	5.66	2.60	6.50	4.49	0.034	2.31
4.50	473.2	70.5	2.655	24.9	0.012	0.1785	347.	321.	0.00370	4.47	2.65	5.32	4.55	0.010	1.58
6.50	472.9	75.1	2.164	30.6	0.016	0.2968	329.	307.	0.00408	4.18	2.03	4.90	4.02	-0.009	1.18
8.50	472.6	80.0	1.761	37.0	0.020	0.4230	409.	385.	0.00306	2.78	1.75	3.42	4.79	-0.023	0.76
9.50	472.4	82.7	1.595	41.5	0.022	0.4947	377.	351.	0.00346	2.71	1.92	3.46	4.24	-0.037	0.72
10.50	472.2	85.8	1.450	45.7	0.024	0.5568	392.	366.	0.00331	2.64	1.92	3.13	4.27	-0.046	0.63
11.50	472.1	89.1	1.325	50.0	0.026	0.6138	517.	492.	0.00232	1.83	1.61	2.35	5.52	-0.040	0.45
13.50	471.7	96.8	1.123	59.0	0.029	0.7104	438.	413.	0.00295	2.04	1.89	2.41	4.26	-0.076	0.45
15.50	471.4	105.6	0.969	68.4	0.032	0.7844	580.	555.	0.00207	1.45	1.59	1.81	5.26	-0.073	0.32
17.50	471.1	114.8	0.852	77.7	0.035	0.8379	553.	527.	0.00226	1.46	1.65	1.74	4.81	-0.101	0.31
19.50	470.7	124.5	0.762	87.0	0.038	0.8766	592.	568.	0.00212	1.32	1.56	1.57	4.56	-0.117	0.28
21.50	470.4	134.7	0.688	96.3	0.041	0.9044	732.	710.	0.00165	1.09	1.32	1.35	5.27	-0.108	0.22
RUN	11-1101	WEIGHT FLOW,	0.1440	HEAT INPUT,	35.79	INLET BULK TEMP,	52.7	OUTLET BULK TEMP,	95.5	PLOT CH 8					
2.50	307.6	58.6	3.384	30.4	0.012	0.0478	318.	291.	0.00400	5.69	1.97	6.31	4.96	0.030	2.56
4.50	307.2	62.0	2.987	34.4	0.016	0.0833	323.	295.	0.00398	5.05	1.56	6.29	4.77	0.016	1.99
6.50	306.9	64.3	2.574	39.9	0.022	0.1364	350.	323.	0.00357	3.97	1.20	5.19	5.02	0.005	1.44
8.50	306.5	65.9	2.169	47.4	0.029	0.2109	373.	346.	0.00332	3.16	1.06	4.27	5.25	-0.001	1.02
9.50	306.4	66.7	1.985	51.8	0.032	0.2538	389.	362.	0.00315	2.79	1.04	3.82	5.42	-0.004	0.86
10.50	306.2	67.6	1.815	56.6	0.036	0.3001	422.	395.	0.00285	2.34	0.97	3.32	5.85	-0.006	0.70
11.50	306.0	68.6	1.660	61.9	0.039	0.3490	437.	411.	0.00273	2.16	1.01	3.01	5.99	-0.009	0.60
13.50	305.7	70.9	1.397	73.6	0.046	0.4432	479.	452.	0.00245	1.67	1.05	2.44	6.38	-0.014	0.45
15.50	305.3	74.1	1.188	86.5	0.053	0.5451	558.	533.	0.00205	1.29	1.05	1.98	7.19	-0.019	0.33
17.50	305.0	78.0	1.025	100.3	0.059	0.6308	555.	529.	0.00208	1.23	1.13	1.79	6.78	-0.028	0.28
19.50	304.6	82.7	0.895	114.8	0.065	0.7036	619.	594.	0.00185	1.04	1.11	1.54	7.18	-0.034	0.23
21.50	304.3	88.1	0.792	129.7	0.070	0.7638	633.	609.	0.00181	0.97	1.13	1.40	6.91	-0.043	0.21
RUN	14-1089	WEIGHT FLOW,	0.1464	HEAT INPUT,	22.88	INLET BULK TEMP,	49.0	OUTLET BULK TEMP,	79.3	PLOT CH 8					
2.50	451.1	54.1	3.918	26.7	0.006	0.0245	281.	263.	0.00285	3.31	1.79	3.64	4.85	0.086	3.51
4.50	450.7	57.7	3.712	28.1	0.009	0.0378	279.	261.	0.00293	3.24	1.61	3.57	4.52	0.070	3.19
6.50	450.9	60.8	3.498	29.9	0.011	0.0555	311.	293.	0.00257	2.80	1.33	3.19	4.82	0.048	2.76
8.50	451.1	63.5	3.279	31.9	0.013	0.0781	322.	304.	0.00248	2.57	1.17	2.98	4.79	0.035	2.40
9.50	450.4	64.7	3.167	33.0	0.014	0.0915	330.	312.	0.00242	2.43	1.10	2.86	4.82	0.029	2.22
10.50	449.7	65.9	3.055	34.2	0.015	0.1062	348.	330.	0.00226	2.22	1.01	2.66	5.01	0.023	2.02
11.50	449.6	67.0	2.943	35.5	0.016	0.1224	366.	348.	0.00213	2.02	0.94	2.47	5.20	0.018	1.83
13.50	449.2	69.0	2.720	38.4	0.018	0.1591	358.	340.	0.00221	1.96	0.87	2.39	4.73	0.011	1.59
15.50	448.9	70.9	2.502	41.8	0.021	0.2023	434.	417.	0.00174	1.45	0.73	1.91	5.88	0.003	1.21
17.50	448.6	72.6	2.292	45.6	0.024	0.2515	427.	410.	0.00178	1.39	0.72	1.82	5.64	-0.002	1.05
19.50	448.2	74.4	2.098	49.8	0.027	0.3041	467.	449.	0.00160	1.17	0.68	1.59	6.04	-0.007	0.85
21.50	447.9	76.2	1.920	54.4	0.030	0.3588	447.	429.	0.00170	1.17	0.70	1.54	5.63	-0.012	0.77
RUN	15-1091	WEIGHT FLOW,	0.1932	HEAT INPUT,	22.75	INLET BULK TEMP,	48.9	OUTLET BULK TEMP,	72.6	PLOT CH 8					
2.50	441.7	52.8	3.977	34.7	0.011	0.0211	312.	295.	0.00244	2.42	1.35	2.71	5.58	0.077	3.55
4.50	441.4	55.6	3.823	36.1	0.012	0.0298	331.	314.	0.00228	2.22	1.19	2.54	5.64	0.062	3.25
6.50	441.2	58.2	3.665	37.6	0.013	0.0407	396.	379.	0.00185	1.76	0.97	2.13	6.51	0.042	2.83
8.50	440.9	60.5	3.502	39.4	0.014	0.0542	419.	402.	0.00174	1.59	0.86	1.98	6.65	0.032	2.50
9.50	440.8	61.6	3.419	40.3	0.015	0.0620	449.	432.	0.00160	1.44	0.79	1.45	7.02	0.027	2.30
10.50	440.7	62.6	3.335	41.3	0.016	0.0705	480.	463.	0.00149	1.30	0.73	1.73	7.40	0.022	2.10
11.50	440.6	63.5	3.251	42.4	0.017	0.0798	493.	477.	0.00144	1.23	0.69	1.67	7.50	0.019	1.95
13.50	440.3	65.3	3.081	44.8	0.019	0.1008	486.	470.	0.00147	1.19	0.65	1.63	7.19	0.015	1.73
15.50	440.1	67.0	2.910	47.4	0.021	0.1251	556.	540.	0.00126	0.99	0.56	1.46	8.06	0.010	1.40
17.50	439.8	68.5	2.741	50.3	0.024	0.1528	514.	497.	0.00139	1.02	0.56	1.46	7.26	0.007	1.29
19.50	439.6	69.9	2.574	53.6	0.027	0.1842	509.	492.	0.00141	0.98	0.53	1.40	7.04	0.004	1.14
21.50	439.3	71.2	2.410	57.2	0.030	0.2193	463.	446.	0.00158	1.04	0.54	1.42	6.27	0.001	1.08
RUN	16-1099	WEIGHT FLOW,	0.1470	HEAT INPUT,	22.47	INLET BULK TEMP,	55.0	OUTLET BULK TEMP,	80.3	PLOT CH 8					
2.50	452.5	59.1	3.619	29.0	0.010	0.0452	234.	215.	0.00374	3.67	1.75	3.97	3.64	0.083	3.18
4.50	452.5	62.0	3.408	30.8	0.012	0.0644	253.	235.	0.00338	3.34	1.48	3.67	3.79	0.058	2.81
6.50	452.5	64.5	3.192	32.9	0.013	0.0887	265.	246.	0.00322	3.07	1.30	3.42	3.82	0.041	2.47
8.50	452.5	66.8	2.975	35.3	0.015	0.1182	254.	236.	0.00346	3.06	1.24	3.41	3.54	0.031	2.23
9.50	452.5	67.8	2.867	36.6	0.017	0.1349	284.	265.	0.00297	2.65	1.07	3.02	3.91	0.022	1.99
10.50	452.5	68.8	2.759	38.0	0.018	0.1531	292.	274.	0.00285	2.49	1.03	2.86	3.99	0.016	1.83
11.50	452.5	69.7	2.653	39.6	0.019	0.1727	279.	261.	0.00307	2.56	1.04	2.92	3.74	0.012	1.76
13.50	452.5	71.5	2.444	42.9	0.022	0.2166	282.	264.	0.00304	2.39	0.98	2.74	3.69	0.003	1.53
15.50	452.5	73.2	2.245	46.7	0.025	0.2654	311.	313.	0.00245	1.85	0.85	2.20	4.28	-0.005	1.21
17.50	452.5	75.0	2.061	50.9	0.027	0.3179	304.	286.	0.00278	1.76	0.82	2.27	3.81	-0.014	1.14
19.50	452.5	76.8	1.893	55.4	0.030	0.3703	373.	355.	0.00212	1.42	0.79	1.74	4.62	-0.017	0.87
21.50	452.5	78.8	1.741	60.3	0.033	0.4246	333.	315.	0.00248	1.57	0.86	1.84	4.00	-0.029	0.85
RUN	18-1087	WEIGHT FLOW,	0.1928	HEAT INPUT,	12.56	INLET BULK TEMP,	49.1	OUTLET BULK TEMP,	64.8	PLOT CH 8					
2.50	463.6	51.3	4.070	33.8	0.010	0.0171	185.	175.	0.00266	1.85	1.18	1.93	3.41	0.171	3.91
4.50	463.5	53.0	3.987	34.5	0.010	0.0212	195.	185.	0.00251	1.81	1.18	1.91	3.48	0.148	3.78
6.50	463.3	54.6	3.902	35.3	0.011	0.0259	167.	156.	0.00324	1.95	1.21	2.03	2.86	0.176	3.74
8.50	463.2	56.2	3.816	36.1	0.012	0.0313	163.	153.	0.00341	1.98	1.19	2.07	2.72	0.169	3.65
9.50	463.1	56.9	3.773	36.5	0.012	0.0342	186.	175.	0.00278	1.87	1.02	1.97	3.08	0.132	3.52
10.50	463														

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.527 inch; heated tube length, 24 inches; material, Inconel X

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q/DL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.00 TEST VOLTAGE, 50.4 HEAT INPUT/UNIT AREA, 0.929 ID, 0.507 OD, 0.527 LENGTH, 24.0														
686491.	151492.	705778.	1.291	0.631	3.0451	10.135	0.3817	0.3520	0.03132	0.93	2.261	25.5	1.76	1.70
907103.	155464.	546663.	1.333	0.645	1.4863	13.044	0.4429	0.3657	0.02736	0.93	2.135	25.3	1.92	1.71
1108487.	203194.	513293.	1.244	0.639	0.8486	11.755	0.4623	0.3598	0.02366	0.93	2.224	26.9	2.31	1.65
1241798.	176071.	354620.	1.040	0.665	0.4548	15.921	0.4435	0.3912	0.01853	0.93	1.895	24.6	2.00	1.90
1281945.	217638.	367384.	0.930	0.658	0.3767	12.834	0.4272	0.3829	0.01768	0.93	2.006	26.2	2.21	1.82
1306568.	222869.	362240.	0.835	0.662	0.2975	12.787	0.4103	0.3880	0.01603	0.93	1.929	26.1	2.16	1.87
1318243.	159885.	244134.	0.761	0.676	0.2113	19.700	0.3749	0.4141	0.01323	0.94	1.554	22.9	1.71	2.25
1312554.	234989.	313490.	0.665	0.672	0.1606	12.274	0.3696	0.4042	0.01217	0.93	1.704	26.1	1.94	2.07
1281947.	176371.	217722.	0.615	0.677	0.1024	17.153	0.3502	0.4174	0.00955	0.94	1.329	23.5	1.55	2.44
1239779.	209266.	243003.	0.595	0.677	0.0813	13.466	0.3399	0.4166	0.00862	0.94	1.322	25.1	1.57	2.40
1193163.	207216.	231169.	0.590	0.677	0.0638	13.954	0.3346	0.4188	0.00757	0.94	1.211	25.2	1.46	2.52
1145409.	162804.	176952.	0.592	0.691	0.0490	16.430	0.3317	0.4093	0.00652	0.95	1.015	23.5	1.27	2.75
HEAT BALANCE, 0.00 TEST VOLTAGE, 50.4 HEAT INPUT/UNIT AREA, 0.933 ID, 0.507 OD, 0.527 LENGTH, 24.0														
963016.	154400.	1189376.	1.377	0.650	4.6940	14.653	0.3676	0.3315	0.03070	0.93	1.664	34.4	1.14	1.66
1220775.	168078.	1032594.	1.655	0.653	2.7337	16.848	0.4461	0.3348	0.02847	0.93	1.663	35.1	1.32	1.60
1521453.	167581.	820538.	2.145	0.663	1.5923	21.030	0.5448	0.3489	0.02510	0.93	1.599	34.2	1.40	1.62
1826483.	180631.	664098.	2.210	0.670	0.9598	23.923	0.5856	0.3608	0.02160	0.93	1.555	33.5	1.49	1.67
1959416.	184105.	594576.	2.052	0.674	0.7560	25.361	0.5795	0.3688	0.01987	0.93	1.520	32.9	1.49	1.72
2075771.	176548.	506056.	1.834	0.679	0.5883	28.485	0.5692	0.3804	0.01791	0.93	1.445	31.7	1.44	1.83
2174602.	182004.	462858.	1.658	0.680	0.4728	29.388	0.5457	0.3856	0.01641	0.93	1.414	31.3	1.44	1.88
2317694.	186062.	384243.	1.200	0.684	0.3100	31.488	0.4851	0.3996	0.01367	0.94	1.325	30.3	1.38	2.04
2394115.	170256.	298263.	0.923	0.684	0.2034	36.371	0.4355	0.4087	0.01123	0.94	1.182	28.6	1.28	2.26
2416680.	197010.	301866.	0.771	0.684	0.1498	31.340	0.3784	0.4088	0.00988	0.94	1.159	29.4	1.28	2.26
2399067.	187649.	260456.	0.685	0.683	0.1066	33.015	0.3703	0.4130	0.00842	0.94	1.050	28.6	1.19	2.43
2353708.	201626.	259286.	0.637	0.683	0.0813	29.900	0.3487	0.4142	0.00748	0.94	0.999	29.2	1.15	2.48
HEAT BALANCE, -0.02 TEST VOLTAGE, 39.9 HEAT INPUT/UNIT AREA, 0.598 ID, 0.507 OD, 0.527 LENGTH, 24.0														
687880.	227288.	1483038.	1.207	0.614	11.0909	6.950	0.2826	0.3364	0.01509	0.60	1.120	35.2	0.65	1.79
787040.	239549.	1415607.	1.227	0.615	7.4356	7.454	0.3098	0.3369	0.01472	0.60	1.097	36.5	0.71	1.75
900121.	212212.	1222700.	1.259	0.632	4.8898	9.720	0.3395	0.3484	0.01414	0.60	1.031	35.4	0.70	1.73
1027703.	211821.	1106425.	1.277	0.638	3.4580	11.072	0.3708	0.3538	0.01352	0.60	1.003	35.5	0.73	1.71
1097279.	210664.	1043028.	1.317	0.641	2.9242	11.926	0.3868	0.3575	0.01316	0.60	0.986	35.4	0.75	1.71
1169658.	197790.	952434.	1.335	0.649	2.4493	13.480	0.4022	0.3655	0.01270	0.60	0.955	34.7	0.74	1.73
1243414.	190789.	868063.	1.349	0.655	2.0664	15.118	0.4164	0.3737	0.01222	0.60	0.926	34.0	0.73	1.77
1393547.	211855.	827240.	1.375	0.653	1.5932	15.059	0.4424	0.3711	0.01161	0.60	0.934	35.0	0.80	1.74
1542413.	170965.	610047.	1.418	0.671	1.1097	21.803	0.4665	0.3967	0.01025	0.60	0.829	32.0	0.72	1.94
1682277.	190999.	581600.	1.377	0.670	0.8715	21.080	0.4750	0.3951	0.00962	0.60	0.834	32.7	0.77	1.93
1804032.	180670.	485785.	1.276	0.675	0.6595	24.480	0.4705	0.4070	0.00867	0.60	0.786	31.6	0.74	2.06
1904882.	209293.	495112.	1.169	0.673	0.5420	21.913	0.4640	0.4017	0.00819	0.60	0.804	32.7	0.80	2.01
HEAT BALANCE, 0.01 TEST VOLTAGE, 40.0 HEAT INPUT/UNIT AREA, 0.595 ID, 0.507 OD, 0.527 LENGTH, 24.0														
873913.	249213.	1844904.	1.205	0.630	11.8873	8.376	0.2753	0.3454	0.01156	0.59	0.862	41.1	0.45	1.81
967471.	232920.	1689321.	1.216	0.640	8.3637	9.913	0.2950	0.3537	0.01126	0.59	0.823	40.8	0.46	1.80
1071307.	182606.	1382598.	1.237	0.662	5.6314	14.380	0.3165	0.3816	0.01065	0.59	0.744	38.0	0.42	1.84
1186619.	173415.	1231524.	1.263	0.667	4.2129	16.988	0.3395	0.3989	0.01019	0.59	0.709	37.6	0.43	1.86
1244640.	159108.	1121139.	1.278	0.672	3.5758	19.927	0.3514	0.3979	0.00983	0.59	0.679	36.6	0.42	1.91
1313541.	146662.	1000915.	1.295	0.676	3.0513	22.969	0.3636	0.4072	0.00949	0.60	0.651	35.6	0.41	1.97
1381152.	143790.	935531.	1.312	0.677	2.6685	24.691	0.3759	0.4112	0.00924	0.60	0.638	35.4	0.41	2.00
1523287.	154091.	808091.	1.344	0.677	2.1386	25.200	0.4001	0.4098	0.00890	0.60	0.634	36.2	0.44	2.01
1672399.	132184.	690863.	1.368	0.678	1.6051	32.946	0.4223	0.4138	0.00821	0.60	0.585	34.2	0.42	2.15
1824718.	157583.	713342.	1.393	0.678	1.3608	29.566	0.4428	0.4121	0.00799	0.60	0.605	36.0	0.47	2.10
1976454.	164913.	672479.	1.443	0.678	1.1207	29.570	0.4529	0.4120	0.00762	0.60	0.604	36.5	0.49	2.11
2123667.	207820.	716942.	1.447	0.675	0.9690	25.304	0.4771	0.4047	0.00743	0.59	0.633	38.7	0.55	2.02
HEAT BALANCE, 0.04 TEST VOLTAGE, 32.1 HEAT INPUT/UNIT AREA, 0.586 ID, 0.507 OD, 0.527 LENGTH, 24.0														
838506.	322150.	1584284.	1.239	0.595	6.9730	5.601	0.3225	0.3289	0.01424	0.58	1.174	40.8	0.85	1.72
955596.	297570.	1422132.	1.273	0.603	4.7513	6.932	0.3523	0.3308	0.01386	0.58	1.111	40.0	0.86	1.68
1085992.	293160.	1294017.	1.311	0.611	3.4023	7.976	0.3830	0.3347	0.01332	0.59	1.082	39.9	0.89	1.64
1226542.	323201.	1276623.	1.341	0.607	2.6090	7.831	0.4118	0.3324	0.01285	0.58	1.111	41.4	1.00	1.60
1294055.	289217.	1116467.	1.351	0.622	2.1485	9.591	0.4248	0.3417	0.01236	0.59	1.044	39.4	0.93	1.61
1372124.	285470.	1050154.	1.363	0.627	1.8525	10.411	0.4371	0.3450	0.01200	0.59	1.027	39.0	0.94	1.62
1444986.	316870.	1074506.	1.381	0.621	1.5703	9.694	0.4493	0.3408	0.01178	0.59	1.059	40.3	1.02	1.58
1587232.	335050.	1007710.	1.408	0.623	1.2920	10.013	0.4695	0.3425	0.01111	0.59	1.059	40.5	1.07	1.57
1715156.	265760.	795372.	1.341	0.645	0.9359	13.229	0.4726	0.3619	0.01002	0.59	0.960	37.7	0.96	1.67
1830651.	350331.	846582.	1.247	0.634	0.7838	11.110	0.4675	0.3512	0.00966	0.59	1.023	39.9	1.10	1.59
1923480.	280627.	629900.	1.163	0.660	0.5721	15.370	0.4606	0.3810	0.00843	0.59	0.887	36.2	0.92	1.80
1997042.	356570.	710167.	1.009	0.648	0.4960	12.047	0.4494	0.3650	0.00820	0.59	0.962	38.9	1.06	1.68
HEAT BALANCE, 0.06 TEST VOLTAGE, 29.5 HEAT INPUT/UNIT AREA, 0.330 ID, 0.507 OD, 0.527 LENGTH, 24.0														
817373.	545843.	2499012.	1.205	0.596	19.6331	3.271	0.2641	0.3398	0.00604	0.33	0.661	52.4	0.39	1.84
865372.	509647.	2412729.	1.203	0.591	15.5559	3.691	0.2741	0.3361	0.00608	0.33	0.619	51.9	0.39	1.81
915591.	652357.	2565750.	1.206	0.613	16.2350	2.926	0.2846	0.3490	0.00588	0.33	0.737	57.2	0.47	1.80
968478.	619576.	2565820.	1.213	0.617	12.1023	2.918	0.2956	0.3504	0.00584	0.33	0.753	58.7	0.50	1.78
996060.	561254.	2396081.	1.217	0.593	10.2511	3.704	0.3014	0.3377	0.00598	0.33	0.635	55.1	0.44	1.76
1024449.	588237.	2418558.	1.222	0.595	9.5992	3.592								

TABLE IV. - Continued. UNIFORMLY

(a) Continued. Test section 1; tube inside diameter, 0.507 inch; tube outside

EL	Pd	Td	RUB	VELDC	M	X2	TD	TW	H	H/HHK	H/HMW	H/HF	T4/TB	THETA	ROFM
RUN 19-1116 WEIGHT FLOW, 0.1450 HEAT INPUT, 35.29 INLET BULK TEMP, 51.9 OUTLET BULK TEMP, 105.1 PLOT CH J															
2.50	623.4	59.6	3.800	27.2	0.009	0.0386	315.	288.	0.00402	3.62	2.41	3.74	4.83	0.088	3.32
4.50	622.9	64.8	3.499	29.6	0.010	0.0698	322.	295.	0.00398	3.39	2.06	3.74	4.55	0.064	2.82
6.50	622.4	69.3	3.193	32.4	0.012	0.1125	361.	334.	0.00348	2.82	1.68	3.21	4.82	0.039	2.25
8.50	621.9	73.3	2.891	35.8	0.015	0.1663	358.	331.	0.00356	2.66	1.55	3.05	4.52	0.024	1.87
9.50	621.6	75.2	2.745	37.7	0.016	0.1968	370.	343.	0.00344	2.48	1.46	2.87	4.56	0.016	1.68
10.50	621.4	77.1	2.602	39.8	0.018	0.2279	401.	374.	0.00310	2.18	1.33	2.58	4.85	0.008	1.45
11.50	621.1	78.9	2.464	42.0	0.019	0.2655	388.	362.	0.00325	2.18	1.33	2.56	4.59	0.002	1.35
13.50	620.6	82.5	2.206	46.9	0.022	0.3416	395.	369.	0.00322	2.00	1.27	2.35	4.47	-0.010	1.12
15.50	620.1	86.2	1.977	52.3	0.025	0.4192	467.	441.	0.00261	1.54	1.15	1.89	5.11	-0.019	0.85
17.50	619.6	90.2	1.777	58.3	0.028	0.4956	494.	468.	0.00245	1.37	1.11	1.70	5.19	-0.028	0.71
19.50	619.1	94.5	1.604	64.5	0.030	0.5673	495.	469.	0.00247	1.30	1.13	1.59	4.96	-0.040	0.63
21.50	618.6	99.2	1.455	71.1	0.033	0.6316	556.	531.	0.00215	1.12	1.06	1.49	5.35	-0.046	0.52
RUN 20-1092 WEIGHT FLOW, 0.0862 HEAT INPUT, 22.83 INLET BULK TEMP, 54.9 OUTLET BULK TEMP, 109.6 PLOT CH K															
2.50	505.2	62.1	3.496	17.6	0.006	0.0608	266.	247.	0.00320	4.59	2.30	5.03	3.98	0.066	2.91
4.50	504.8	66.6	3.138	19.6	0.008	0.1044	293.	275.	0.00286	3.89	1.63	4.38	4.12	0.037	2.31
6.50	504.5	70.5	2.780	22.1	0.010	0.1629	300.	282.	0.00281	3.50	1.61	3.99	4.00	0.018	1.85
8.50	504.2	73.9	2.436	25.3	0.012	0.2369	292.	275.	0.00296	3.30	1.53	3.76	3.72	0.002	1.51
9.50	504.0	75.6	2.274	27.1	0.014	0.2789	318.	300.	0.00265	2.86	1.41	3.31	3.97	-0.006	1.29
10.50	503.8	77.2	2.123	29.0	0.015	0.3227	335.	317.	0.00248	2.56	1.36	3.00	4.11	-0.012	1.13
11.50	503.7	79.0	1.982	31.1	0.016	0.3673	352.	335.	0.00233	2.30	1.31	2.72	4.24	-0.018	0.99
13.50	503.3	82.7	1.732	35.6	0.018	0.4576	343.	325.	0.00246	2.21	1.37	2.56	3.93	-0.035	0.85
15.50	503.0	86.8	1.522	40.4	0.021	0.5440	437.	420.	0.00180	1.53	1.18	1.88	4.83	-0.038	0.61
17.50	502.7	91.6	1.349	45.6	0.023	0.6216	417.	400.	0.00194	1.53	1.27	1.82	4.37	-0.056	0.56
19.50	502.3	96.9	1.206	51.1	0.025	0.6882	456.	439.	0.00176	1.30	1.22	1.56	4.53	-0.066	0.47
21.50	502.0	102.7	1.087	56.6	0.027	0.7443	498.	482.	0.00159	1.15	1.17	1.39	4.69	-0.075	0.40
RUN 21-1086 WEIGHT FLOW, 0.1418 HEAT INPUT, 12.21 INLET BULK TEMP, 49.7 OUTLET BULK TEMP, 70.0 PLOT CH L															
2.50	532.9	52.7	4.063	24.9	0.007	0.0187	195.	185.	0.00239	1.96	1.37	2.05	3.52	0.173	3.90
4.50	532.8	54.9	3.956	25.6	0.008	0.0249	208.	198.	0.00222	1.91	1.23	2.02	3.61	0.145	3.73
6.50	532.7	57.0	3.848	26.3	0.008	0.0321	233.	223.	0.00192	1.79	1.06	1.91	3.92	0.112	3.51
8.50	532.6	58.9	3.738	27.1	0.009	0.0405	244.	234.	0.00182	1.72	0.97	1.85	3.97	0.095	3.32
9.50	532.6	59.9	3.682	27.5	0.009	0.0452	248.	238.	0.00179	1.68	0.93	1.82	3.98	0.088	3.22
10.50	532.6	60.8	3.626	27.9	0.010	0.0503	251.	241.	0.00176	1.65	0.90	1.79	3.97	0.082	3.13
11.50	532.5	61.6	3.569	28.4	0.010	0.0558	259.	249.	0.00170	1.60	0.80	1.74	4.34	0.075	3.02
13.50	532.4	63.3	3.455	29.3	0.011	0.0677	254.	244.	0.00176	1.60	0.83	1.74	3.86	0.068	2.87
15.50	532.3	64.9	3.340	30.3	0.011	0.0812	280.	270.	0.00155	1.43	0.73	1.59	4.17	0.052	2.62
17.50	532.3	66.4	3.225	31.4	0.012	0.0963	269.	259.	0.00166	1.46	0.72	1.61	3.90	0.048	2.49
19.50	532.2	67.8	3.109	32.5	0.013	0.1130	286.	276.	0.00154	1.34	0.66	1.50	4.07	0.038	2.28
21.50	532.1	69.1	2.994	33.8	0.014	0.1311	276.	266.	0.00162	1.36	0.65	1.52	3.85	0.033	2.17
RUN 22-1111 WEIGHT FLOW, 0.0649 HEAT INPUT, 33.83 INLET BULK TEMP, 72.7 OUTLET BULK TEMP, 232.0 PLOT CH M															
2.50	270.7	65.0	0.733	63.2	0.035	0.7687	614.	592.	0.00171	1.74	2.06	2.53	6.97	-0.041	0.19
4.50	270.5	67.7	0.586	79.0	0.040	0.8568	610.	588.	0.00177	1.66	2.16	2.21	6.03	-0.069	0.17
6.50	270.2	111.8	0.488	75.0	0.045	0.9102	1327.	1311.	0.00075	0.73	1.39	1.44	11.73	-0.040	0.08
8.50	270.0	126.5	0.419	110.7	0.049	0.9421	1194.	1177.	0.00085	0.82	1.39	1.36	9.31	-0.059	0.08
9.50	269.9	133.9	0.391	118.4	0.051	0.9532	1179.	1163.	0.00087	0.83	1.39	1.31	8.68	-0.068	0.08
10.50	269.8	141.4	0.367	126.1	0.053	0.9619	1079.	1061.	0.00097	0.91	1.39	1.32	7.50	-0.084	0.09
11.50	269.7	148.6	0.347	133.3	0.055	0.9999	1057.	1039.	0.00100	0.92	1.36	1.27	7.00	-0.095	0.08
13.50	269.4	162.3	0.315	147.1	0.059	0.9999	962.	943.	0.00113	1.00	1.34	1.29	5.81	-0.126	0.09
15.50	269.2	176.0	0.288	160.7	0.063	0.9999	1031.	1014.	0.00106	0.92	1.20	1.18	5.76	-0.134	0.08
17.50	269.0	188.9	0.267	173.4	0.066	0.9999	985.	966.	0.00114	0.95	1.17	1.17	5.12	-0.161	0.09
19.50	268.7	201.4	0.250	185.6	0.069	0.9999	1049.	1031.	0.00107	0.89	1.06	1.09	5.12	-0.166	0.08
21.50	268.5	213.7	0.234	197.6	0.072	0.9999	1007.	989.	0.00115	0.91	1.04	1.09	4.63	-0.193	0.08
RUN 23-1165 WEIGHT FLOW, 0.0810 HEAT INPUT, 33.46 INLET BULK TEMP, 107.6 OUTLET BULK TEMP, 226.0 PLOT CH N															
2.50	407.8	120.4	0.685	84.4	0.038	0.8852	813.	793.	0.00127	1.64	1.33	1.41	6.58	-0.075	0.18
4.50	407.8	131.3	0.613	94.3	0.041	0.9145	897.	876.	0.00117	0.93	1.23	1.27	6.67	-0.082	0.16
6.50	407.8	142.5	0.555	104.2	0.043	0.9917	961.	941.	0.00110	0.86	1.14	1.16	6.50	-0.091	0.14
8.50	407.8	153.2	0.510	113.4	0.046	0.9999	1004.	985.	0.00105	0.81	1.07	1.08	6.43	-0.100	0.13
9.50	407.8	158.5	0.491	117.9	0.047	0.9999	1076.	1057.	0.00098	0.75	1.09	1.02	6.67	-0.098	0.12
10.50	407.8	163.8	0.473	122.3	0.048	0.9999	1053.	1033.	0.00101	0.76	0.99	1.01	6.31	-0.108	0.13
11.50	407.8	169.1	0.456	126.8	0.050	0.9999	1052.	1033.	0.00102	0.76	0.97	0.99	6.11	-0.115	0.13
13.50	407.8	179.7	0.426	135.6	0.052	0.9999	957.	935.	0.00116	0.92	0.97	1.01	5.21	-0.145	0.14
15.50	407.8	189.5	0.403	143.6	0.054	0.9999	981.	961.	0.00114	0.79	0.93	0.97	5.37	-0.155	0.13
17.50	407.8	199.1	0.382	151.5	0.056	0.9999	912.	892.	0.00126	0.84	0.94	0.99	4.48	-0.186	0.14
19.50	407.8	208.8	0.363	159.2	0.058	0.9999	912.	891.	0.00128	0.84	0.91	0.97	4.27	-0.203	0.14
21.50	407.8	218.2	0.347	166.8	0.059	0.9999	863.	842.	0.00140	0.88	0.92	1.00	3.86	-0.238	0.14
RUN 26-1110 WEIGHT FLOW, 0.0967 HEAT INPUT, 34.33 INLET BULK TEMP, 70.8 OUTLET BULK TEMP, 178.0 PLOT CH O															
2.50	279.6	77.8	0.914	75.6	0.045	0.6675	955.	935.	0.00105	0.84	1.11	1.34	12.01	-0.016	0.15
4.50	279.3	85.2	0.759	91.0	0.050	0.7610	1001.	981.	0.00101	0.78	1.15	1.59	11.52	-0.023	0.13
6.50	279.0	93.7	0.646	106.9	0.056	0.8287	1012.	994.	0.00100	0.76	1.17	1.41	10.60	-0.033	0.11
8.50	278.7	103.0	0.562	122.9	0.060	0.8764	943.	923.	0.00110	0.81	1.23	1.32	8.96	-0.047	0.11
9.50	278.5	107.9	0.527	130.9	0.062	0.8947	952.	932.	0.00109	0.79	1.22	1.25	8.63	-0.053	0.11
10.50	278.4	112.7	0.499	138.6	0.065	0.9094	896.	875.	0.00118	0.84	1.25	1.25	7.77	-0.063	0.11
11.50	278.2	117.5	0.472	146.2	0.067	0.9219	872.	852.	0.00122	0.85	1.25	1.22	7.25	-0.072	0.11
13.50	277.9	127.3	0.428	161.3	0.071	0.9415	792.	771.	0.00137	0.92	1.29	1.21	6.36	-0.098	0.12
15.50	277.6	137.3	0.391	176.4	0.076	0.9558	839.	818.	0.00131	0.86	1.21	1.12	5.96	-0.107	0.11
17.50	277.3	147.1	0.361	191.0	0.080	0.9999	778.	757.	0.00146	0.91	1.22	1.12	5.15	-0.136	0.11
19.50	277.0	156.4	0.337	204.6	0.083	0.9999	808.	789.	0.00141	0.87	1.14	1.06	5.04	-0.146	0.11
21.50	276.7	165.6	0.316	218.2	0.087	0.9999	767.	746.	0.00154	0.90	1.13	1.07	4.50	-0.175	0.11

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.527 inch; heated tube length, 24 inches; material, Inconel X

RE-B	RE-F	RE-F,MN	PR-D	PR-F	XITF	VIS-RAT	PHI-B	PHI-F	EFLUX	DWDL	H/G-H	SIMPLE	NU/NUJ	TOLK
HEAT BALANCE, 0.01 TEST VOLTAGE, 49.9 HEAT INPUT/UNIT AREA, 0.921 ID, 0.507 OD, 0.527 LENGTH, 24.0														
729022.	266703.	131959.	1.184	0.614	8.0885	6.146	0.2760	0.3622	0.01728	0.92	1.601	35.1	0.99	1.82
879156.	272734.	1187118.	1.184	0.618	4.5638	7.112	0.3325	0.3658	0.01650	0.92	1.537	36.1	1.08	1.78
1050191.	246681.	974177.	1.175	0.636	2.6884	9.499	0.3676	0.3817	0.01519	0.92	1.413	35.1	1.08	1.81
1231227.	270478.	891367.	1.141	0.636	1.8056	9.969	0.3950	0.3823	0.01422	0.92	1.399	36.3	1.19	1.80
1320399.	269626.	824531.	1.122	0.641	1.4900	10.741	0.4056	0.3874	0.01358	0.92	1.365	36.1	1.20	1.83
1406356.	250170.	720312.	1.109	0.650	1.1715	12.537	0.4150	0.3974	0.01271	0.92	1.287	35.0	1.16	1.90
1487510.	274739.	717892.	1.095	0.648	1.0232	11.884	0.4221	0.3948	0.01233	0.92	1.367	36.0	1.23	1.88
1627998.	294643.	657112.	1.020	0.650	0.7366	12.072	0.4232	0.3974	0.01123	0.92	1.281	36.4	1.28	1.92
1733327.	273226.	504365.	0.939	0.664	0.5090	15.718	0.4169	0.4167	0.00963	0.92	1.130	34.1	1.14	2.14
1805051.	256320.	451407.	0.862	0.667	0.3798	16.276	0.4071	0.4202	0.00861	0.93	1.072	33.8	1.12	2.23
1847142.	279473.	441978.	0.786	0.667	0.2977	15.091	0.3947	0.4202	0.00788	0.93	1.053	34.6	1.14	2.25
1864931.	256332.	374455.	0.723	0.670	0.2253	16.971	0.3823	0.4216	0.00694	0.93	0.954	33.3	1.06	2.39
HEAT BALANCE, 0.01 TEST VOLTAGE, 39.8 HEAT INPUT/UNIT AREA, 0.596 ID, 0.507 OD, 0.527 LENGTH, 24.0														
528657.	174792.	813738.	1.232	0.605	5.1576	6.571	0.3473	0.3404	0.02195	0.59	1.676	25.5	1.24	1.72
653275.	164034.	679877.	1.265	0.620	2.8873	8.671	0.3843	0.3498	0.02045	0.59	1.574	25.0	1.29	1.68
789289.	175135.	601234.	1.268	0.625	1.8036	9.698	0.4228	0.3533	0.01866	0.59	1.551	25.4	1.41	1.66
921543.	203459.	565676.	1.276	0.624	1.2056	9.514	0.4514	0.3521	0.01732	0.59	1.564	26.4	1.60	1.62
981054.	191362.	494981.	1.226	0.635	0.9500	10.927	0.4537	0.3618	0.01611	0.60	1.505	25.5	1.54	1.67
1033267.	187120.	446743.	1.157	0.643	0.7691	11.764	0.4503	0.3694	0.01503	0.60	1.453	25.1	1.51	1.71
1077638.	186858.	409072.	1.097	0.650	0.6294	12.540	0.4458	0.3772	0.01471	0.60	1.403	24.7	1.47	1.77
1143649.	218985.	406290.	0.970	0.648	0.4599	11.089	0.4309	0.3748	0.01270	0.60	1.430	25.6	1.58	1.75
1182046.	172756.	287255.	0.844	0.669	0.3016	15.619	0.4104	0.4051	0.01034	0.60	1.180	23.1	1.28	2.06
1197749.	204999.	304223.	0.748	0.667	0.2355	12.802	0.3911	0.4009	0.00949	0.60	1.202	24.3	1.35	2.01
1196498.	198474.	271621.	0.682	0.673	0.1766	13.590	0.3746	0.4131	0.00827	0.60	1.102	23.9	1.24	2.16
1183335.	190380.	244377.	0.639	0.675	0.1357	14.156	0.3608	0.4155	0.00728	0.60	1.007	23.5	1.16	2.28
HEAT BALANCE, 0.05 TEST VOLTAGE, 29.0 HEAT INPUT/UNIT AREA, 0.319 ID, 0.507 OD, 0.527 LENGTH, 24.0														
601967.	413800.	1747999.	1.201	0.598	18.7077	3.151	0.2651	0.3459	0.00707	0.32	0.781	40.3	0.47	1.85
646988.	380853.	1670798.	1.196	0.592	13.8332	3.664	0.2776	0.3422	0.00712	0.32	0.724	39.8	0.46	1.82
694743.	325824.	1538583.	1.198	0.592	10.2145	4.649	0.2909	0.3387	0.00715	0.32	0.656	38.2	0.43	1.79
745784.	310442.	1462852.	1.204	0.595	8.0056	5.279	0.3049	0.3393	0.00709	0.32	0.632	38.0	0.43	1.77
772626.	304865.	1426966.	1.207	0.598	7.1416	5.511	0.3120	0.3406	0.00704	0.32	0.622	37.9	0.43	1.76
800366.	302455.	1396784.	1.211	0.600	6.4156	5.741	0.3193	0.3416	0.00699	0.32	0.615	38.0	0.44	1.75
829008.	293246.	1350355.	1.215	0.603	5.7310	6.147	0.3267	0.3436	0.00692	0.32	0.604	37.7	0.43	1.74
888928.	307877.	1330508.	1.223	0.602	4.8031	6.190	0.3415	0.3429	0.00682	0.32	0.607	38.5	0.46	1.72
952207.	274109.	1195235.	1.231	0.615	3.8236	7.578	0.3564	0.3506	0.00664	0.32	0.573	37.1	0.44	1.71
1018421.	298355.	1199403.	1.237	0.610	3.3063	7.292	0.3709	0.3477	0.00653	0.32	0.584	38.3	0.47	1.69
1086969.	262160.	1102242.	1.240	0.619	2.7120	8.325	0.3847	0.3531	0.00635	0.32	0.564	37.5	0.47	1.69
1157090.	305841.	1103224.	1.239	0.615	2.3902	8.462	0.3972	0.3506	0.00623	0.32	0.574	38.6	0.50	1.67
HEAT BALANCE, 0.03 TEST VOLTAGE, 50.4 HEAT INPUT/UNIT AREA, 0.891 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1105632.	92056.	117926.	0.638	0.684	0.0752	30.934	0.3439	0.4121	0.01600	0.87	1.818	15.3	2.09	2.43
1034136.	112442.	129913.	0.600	0.684	0.0470	22.930	0.3130	0.4127	0.01304	0.87	1.690	16.5	1.98	2.45
955715.	39071.	42767.	0.599	0.672	0.0213	67.301	0.2981	0.4152	0.00975	0.90	1.034	11.8	1.34	3.76
884597.	52589.	55630.	0.612	0.677	0.0168	44.716	0.2773	0.4114	0.00856	0.90	1.061	13.3	1.30	3.54
852362.	56780.	59374.	0.619	0.677	0.0150	39.440	0.2985	0.4112	0.00806	0.90	0.970	13.7	1.27	3.53
822382.	68499.	70967.	0.625	0.681	0.0142	30.685	0.3003	0.4080	0.00766	0.89	0.981	14.8	1.28	3.36
796118.	73896.	73906.	0.632	0.681	0.0001	27.144	0.3047	0.4075	0.00730	0.89	0.963	15.3	1.29	3.34
750412.	91806.	91815.	0.646	0.685	0.0001	19.734	0.3165	0.4046	0.00673	0.89	0.967	16.8	1.29	3.18
710509.	88683.	88691.	0.656	0.681	0.0001	19.312	0.3285	0.4076	0.00620	0.89	0.889	16.9	1.18	3.34
707398.	100379.	100388.	0.665	0.683	0.0002	15.769	0.3409	0.4064	0.00582	0.89	0.863	17.9	1.17	3.28
648724.	96413.	96421.	0.672	0.680	0.0001	15.735	0.3533	0.4090	0.00548	0.89	0.824	17.9	1.09	3.42
623037.	168833.	168850.	0.677	0.681	0.0001	13.247	0.3654	0.4080	0.00521	0.89	0.824	18.8	1.09	3.37
HEAT BALANCE, 0.03 TEST VOLTAGE, 48.7 HEAT INPUT/UNIT AREA, 0.879 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1083137.	108732.	121269.	0.590	0.694	0.0458	24.541	0.3258	0.4052	0.00758	0.87	1.038	18.9	1.30	2.85
1032971.	103131.	111582.	0.595	0.689	0.0357	24.783	0.3229	0.4049	0.00676	0.87	0.934	18.7	1.20	3.01
984889.	109993.	101715.	0.602	0.685	0.0045	24.097	0.3223	0.4049	0.00611	0.87	0.855	18.8	1.15	3.15
943196.	101379.	101389.	0.614	0.683	0.0001	22.866	0.3278	0.4068	0.00565	0.88	0.802	19.1	1.08	3.26
923748.	94428.	94438.	0.620	0.679	0.0001	24.264	0.3312	0.4094	0.00543	0.88	0.757	18.7	1.02	3.40
909075.	100534.	100543.	0.625	0.680	0.0001	22.049	0.3347	0.4088	0.00526	0.88	0.752	19.3	1.01	3.37
867196.	103497.	103506.	0.630	0.680	0.0001	20.838	0.3385	0.4090	0.00510	0.88	0.740	19.6	0.99	3.38
853752.	125154.	125165.	0.639	0.683	0.0001	15.916	0.3462	0.4060	0.00483	0.87	0.759	21.2	1.01	3.22
825485.	120100.	120110.	0.647	0.682	0.0002	15.167	0.3545	0.4072	0.00459	0.88	0.729	21.5	0.97	3.28
799515.	145156.	145169.	0.654	0.685	0.0001	12.302	0.3630	0.4051	0.00440	0.87	0.748	22.9	0.99	3.17
775553.	150508.	150522.	0.660	0.684	0.0001	11.340	0.3714	0.4055	0.00422	0.87	0.735	23.4	0.97	3.19
753631.	167724.	167741.	0.665	0.686	0.0001	9.558	0.3790	0.4048	0.00407	0.87	0.755	24.6	1.00	3.12
HEAT BALANCE, 0.01 TEST VOLTAGE, 50.3 HEAT INPUT/UNIT AREA, 0.897 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1674607.	56577.	83399.	0.729	0.689	0.0928	81.421	0.3838	0.4038	0.01176	0.90	1.128	16.1	1.36	3.00
1633962.	62424.	81172.	0.642	0.687	0.0613	71.635	0.3475	0.4037	0.00986	0.90	1.041	16.4	1.29	3.10
1566283.	79799.	80013.	0.607	0.686	0.0434	59.703	0.3235	0.4040	0.00853	0.90	0.973	17.1	1.23	3.13
1488641.	89694.	101684.	0.596	0.689	0.0336	43.732	0.3077	0.4038	0.00758	0.90	0.948	18.6	1.20	3.04
1443271.	93469.	103866.	0.595	0.688	0.0294	40.603	0.3018	0.4037	0.00714	0.90	0.916	19.0	1.17	3.06
1412390.	107539.	117654.	0.598	0.691	0.0279	33.705	0.3001	0.4038	0.00684	0.90	0.922	20.0		

TABLE IV. - Continued. UNIFORMLY

(a) Concluded. Test section 1; tube inside diameter, 0.507 inch; tube outside

EL	Pd	TB	POB	VLLOC	M	x2	TG	TW	H	H/HHK	H/HMW	H/HIF	TW/TB	THETA	KOFM
RUN 29-1168 WEIGHT FLOW, 0.1220 HEAT INPUT, 33.72 INLET BULK TEMP, 72.0 OUTLET BULK TEMP, 139.7 PLOT CH I															
2.50	420.6	75.5	1.819	50.6	0.028	0.3769	667.	644.	0.00154	1.20	0.88	1.99	8.52	-0.009	0.51
4.50	420.6	78.9	1.569	58.7	0.033	0.4712	740.	718.	0.00138	1.00	0.86	1.73	9.11	-0.013	0.38
6.50	420.6	82.8	1.365	57.4	0.037	0.5650	835.	812.	0.00122	0.85	0.84	1.53	9.80	-0.017	0.30
8.50	420.6	87.4	1.200	76.7	0.040	0.6398	812.	791.	0.00126	0.84	0.89	1.40	9.95	-0.024	0.27
9.50	420.6	90.0	1.129	81.5	0.042	0.6738	828.	807.	0.00124	0.81	0.89	1.34	8.97	-0.027	0.25
10.50	420.6	92.6	1.066	86.4	0.044	0.7058	795.	773.	0.00130	0.83	0.92	1.30	8.35	-0.032	0.25
11.50	420.6	95.5	1.008	91.3	0.046	0.7349	781.	760.	0.00133	0.83	0.94	1.26	7.96	-0.037	0.24
13.50	420.6	101.5	0.909	101.3	0.049	0.7851	715.	693.	0.00149	0.86	1.01	1.20	6.83	-0.052	0.24
15.50	420.6	107.8	0.827	111.4	0.052	0.8257	715.	693.	0.00150	0.84	1.02	1.14	6.43	-0.064	0.23
17.50	420.6	114.3	0.760	121.1	0.055	0.8570	666.	643.	0.00166	0.87	1.06	1.11	5.63	-0.083	0.23
19.50	420.6	120.9	0.704	130.8	0.058	0.8921	660.	637.	0.00170	0.86	1.06	1.07	5.27	-0.097	0.23
21.50	420.6	127.7	0.656	140.5	0.061	0.9222	636.	613.	0.00181	0.87	1.08	1.06	4.80	-0.118	0.23
RUN 32-1108 WEIGHT FLOW, 0.0630 HEAT INPUT, 14.56 INLET BULK TEMP, 79.4 OUTLET BULK TEMP, 136.0 PLOT CH H															
2.50	454.7	83.6	1.476	30.5	0.016	0.5340	471.	460.	0.00101	1.14	0.89	1.48	5.51	-0.030	0.53
4.50	454.5	87.5	1.320	34.1	0.018	0.6049	477.	467.	0.00100	1.07	0.92	1.37	5.34	-0.040	0.47
6.50	454.2	91.8	1.189	37.0	0.019	0.6674	542.	531.	0.00086	0.91	0.87	1.19	5.79	-0.045	0.38
8.50	454.0	96.6	1.078	41.7	0.021	0.7215	567.	556.	0.00083	0.84	0.86	1.09	5.75	-0.053	0.34
9.50	453.9	99.2	1.029	43.7	0.021	0.7454	599.	588.	0.00078	0.78	0.84	1.03	5.93	-0.055	0.31
10.50	453.8	101.8	0.984	45.7	0.022	0.7674	576.	566.	0.00079	0.77	0.85	1.00	5.76	-0.061	0.31
11.50	453.7	104.6	0.943	47.7	0.023	0.7875	587.	577.	0.00081	0.78	0.86	0.99	5.52	-0.069	0.30
13.50	453.4	110.1	0.870	51.7	0.024	0.8220	566.	555.	0.00086	0.78	0.89	0.95	5.04	-0.085	0.30
15.50	453.2	115.8	0.809	55.6	0.025	0.8498	580.	569.	0.00084	0.75	0.87	0.91	4.92	-0.096	0.28
17.50	453.0	121.6	0.755	59.5	0.026	0.8728	550.	548.	0.00089	0.76	0.89	0.90	4.50	-0.116	0.28
19.50	452.7	127.6	0.709	63.5	0.027	0.8918	554.	543.	0.00092	0.75	0.89	0.88	4.26	-0.134	0.27
21.50	452.5	133.6	0.668	67.4	0.029	0.9072	526.	516.	0.00099	0.78	0.92	0.89	3.86	-0.161	0.28
RUN 33-1104 WEIGHT FLOW, 0.0850 HEAT INPUT, 14.62 INLET BULK TEMP, 76.7 OUTLET BULK TEMP, 126.6 PLOT CH X															
2.50	253.0	81.0	0.736	82.5	0.047	0.7456	392.	381.	0.00127	1.04	0.97	1.28	4.70	-0.059	0.27
4.50	253.0	84.9	0.676	89.8	0.050	0.7869	424.	413.	0.00116	0.91	0.95	1.13	4.86	-0.066	0.24
6.50	253.0	89.1	0.624	97.2	0.052	0.8193	454.	443.	0.00108	0.81	0.92	1.01	4.37	-0.073	0.21
8.50	253.0	93.4	0.580	104.6	0.055	0.8465	466.	455.	0.00106	0.77	0.92	0.95	4.87	-0.084	0.20
9.50	253.0	95.7	0.560	108.3	0.056	0.8585	495.	484.	0.00098	0.71	0.89	0.89	5.06	-0.084	0.19
10.50	253.0	98.0	0.542	112.0	0.057	0.8694	495.	484.	0.00093	0.71	0.89	0.88	4.94	-0.090	0.18
11.50	253.0	100.3	0.524	115.8	0.058	0.8795	507.	491.	0.00098	0.69	0.89	0.86	4.90	-0.095	0.18
13.50	253.0	105.1	0.492	123.2	0.060	0.8971	499.	488.	0.00100	0.69	0.90	0.83	4.65	-0.109	0.17
15.50	253.0	109.9	0.465	130.6	0.062	0.9118	532.	521.	0.00093	0.64	0.86	0.77	4.74	-0.114	0.16
17.50	253.0	114.6	0.441	137.7	0.064	0.9238	502.	491.	0.00102	0.67	0.88	0.79	4.28	-0.137	0.17
19.50	253.0	119.4	0.419	144.8	0.066	0.9341	526.	515.	0.00097	0.63	0.85	0.74	4.31	-0.142	0.16
21.50	253.0	124.7	0.400	151.8	0.068	0.9429	485.	474.	0.00109	0.68	0.89	0.78	3.82	-0.174	0.17
RUN 35-1103 WEIGHT FLOW, 0.1130 HEAT INPUT, 14.74 INLET BULK TEMP, 74.3 OUTLET BULK TEMP, 110.4 PLOT CH Z															
2.50	257.0	77.2	0.829	97.3	0.058	0.6937	311.	299.	0.00173	1.20	0.89	1.41	3.88	-0.062	0.36
4.50	257.0	79.9	0.772	104.4	0.061	0.7274	347.	336.	0.00150	1.00	0.94	1.19	4.21	-0.064	0.31
6.50	257.0	82.7	0.723	111.6	0.063	0.7612	354.	343.	0.00148	0.94	0.85	1.12	4.15	-0.074	0.29
8.50	257.0	85.7	0.678	118.9	0.066	0.7893	381.	369.	0.00136	0.84	0.83	1.00	4.31	-0.079	0.26
9.50	257.0	87.2	0.658	122.6	0.067	0.8020	390.	379.	0.00132	0.80	0.82	0.96	4.34	-0.082	0.25
10.50	257.0	88.8	0.639	126.2	0.068	0.8140	399.	387.	0.00129	0.77	0.81	0.93	4.36	-0.085	0.24
11.50	257.0	90.4	0.621	129.9	0.069	0.8251	401.	390.	0.00129	0.76	0.81	0.91	4.31	-0.090	0.24
13.50	257.0	93.8	0.588	137.3	0.071	0.8454	395.	384.	0.00133	0.76	0.84	0.89	4.09	-0.105	0.23
15.50	257.0	97.2	0.557	144.7	0.074	0.8632	428.	417.	0.00121	0.67	0.79	0.80	4.29	-0.106	0.21
17.50	257.0	100.7	0.530	152.1	0.076	0.8788	405.	394.	0.00131	0.71	0.84	0.83	3.91	-0.127	0.22
19.50	257.0	104.3	0.506	159.5	0.078	0.8925	440.	429.	0.00119	0.63	0.79	0.74	4.11	-0.126	0.20
21.50	257.0	108.0	0.483	166.9	0.080	0.9045	399.	388.	0.00138	0.71	0.86	0.80	3.59	-0.159	0.21
RUN 36-1106 WEIGHT FLOW, 0.1340 HEAT INPUT, 14.71 INLET BULK TEMP, 76.5 OUTLET BULK TEMP, 96.0 PLOT CH +															
2.50	477.7	78.2	1.917	49.9	0.026	0.3760	298.	277.	0.00193	1.32	0.68	1.51	3.54	-0.025	1.07
4.50	477.5	79.6	1.808	52.9	0.028	0.4141	308.	295.	0.00177	1.18	0.65	1.36	3.72	-0.030	0.94
6.50	477.2	81.1	1.708	56.0	0.030	0.4522	341.	330.	0.00154	1.00	0.61	1.18	4.07	-0.032	0.82
8.50	477.0	82.7	1.614	59.3	0.031	0.4896	346.	335.	0.00152	0.95	0.61	1.12	4.04	-0.038	0.76
9.50	476.9	83.6	1.570	60.9	0.032	0.5079	356.	345.	0.00147	0.91	0.60	1.07	4.12	-0.040	0.72
10.50	476.8	84.4	1.528	62.6	0.033	0.5258	370.	359.	0.00140	0.85	0.59	1.01	4.25	-0.041	0.68
11.50	476.7	85.3	1.487	64.3	0.034	0.5434	367.	356.	0.00142	0.85	0.60	1.00	4.17	-0.045	0.66
13.50	476.4	87.2	1.411	67.8	0.035	0.5773	373.	362.	0.00140	0.81	0.60	0.95	4.15	-0.051	0.62
15.50	476.2	89.1	1.340	71.4	0.037	0.6095	373.	362.	0.00132	0.75	0.59	0.98	4.28	-0.055	0.56
17.50	476.0	91.2	1.275	75.0	0.038	0.6337	388.	377.	0.00135	0.74	0.60	0.96	4.14	-0.063	0.54
19.50	475.7	93.3	1.216	78.7	0.039	0.6580	401.	390.	0.00130	0.70	0.60	0.82	4.18	-0.068	0.51
21.50	475.5	95.6	1.160	82.4	0.041	0.6943	370.	367.	0.00142	0.73	0.63	0.84	3.84	-0.083	0.51



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.527 inch; heated tube length, 24 inches; material, Inconel X

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q/DL	H/H-H	SIMPL	NU/NOT	TOLK
HEAT BALANCE, -0.04 TEST VOLTAGE, 48.7 HEAT INPUT/UNIT AREA, 0.864 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1747986.	101735.	243628.	1.205	0.679	0.4000	45.289	0.4706	0.4186	0.01194	0.88	1.033	24.0	1.03	2.50
1847679.	99302.	197189.	1.007	0.678	0.2695	49.553	0.4435	0.4149	0.01025	0.88	0.960	23.3	1.02	2.64
1900613.	92612.	158214.	0.845	0.695	0.1860	54.396	0.4147	0.4055	0.00881	0.89	0.896	22.4	1.01	2.78
1916356.	108603.	164244.	0.738	0.696	0.1426	46.164	0.3907	0.4059	0.00788	0.89	0.881	23.3	1.02	2.77
1913520.	111409.	160461.	0.701	0.695	0.1241	44.882	0.3804	0.4054	0.00743	0.89	0.857	23.4	1.01	2.80
1905105.	125202.	172524.	0.672	0.697	0.1121	39.252	0.3712	0.4062	0.00711	0.88	0.859	24.3	1.02	2.75
1892139.	135437.	179665.	0.549	0.674	0.1007	35.803	0.3629	0.4073	0.00679	0.88	0.851	24.9	1.02	2.74
1856031.	172454.	214740.	0.617	0.677	0.0849	27.170	0.3486	0.4153	0.00632	0.88	0.853	26.9	1.02	2.68
1810920.	186866.	221992.	0.598	0.679	0.0699	24.099	0.3369	0.4144	0.00579	0.86	0.825	27.7	1.00	2.69
1763203.	223577.	256218.	0.591	0.677	0.0614	19.041	0.3315	0.4171	0.00545	0.88	0.837	29.6	1.01	2.62
1713803.	241086.	268864.	0.590	0.677	0.0532	16.874	0.3279	0.4170	0.00508	0.88	0.818	30.6	0.99	2.63
1664298.	269214.	295762.	0.592	0.678	0.0477	14.298	0.3257	0.4178	0.00479	0.88	0.816	32.0	0.99	2.60
HEAT BALANCE, 0.07 TEST VOLTAGE, 32.0 HEAT INPUT/UNIT AREA, 0.381 ID, 0.507 OD, 0.527 LENGTH, 24.0														
895144.	105228.	180887.	0.875	0.677	0.2825	20.361	0.4187	0.4120	0.00919	0.38	0.923	16.9	0.98	2.15
907390.	113917.	176184.	0.774	0.677	0.2189	18.909	0.3985	0.4124	0.00830	0.38	0.899	17.1	0.98	2.18
908667.	103965.	148415.	0.704	0.678	0.1639	21.170	0.3813	0.4151	0.00723	0.38	0.810	16.4	0.91	2.34
901804.	106050.	141444.	0.657	0.678	0.1302	20.571	0.3668	0.4164	0.00652	0.38	0.768	16.5	0.88	2.41
896071.	101916.	132203.	0.640	0.678	0.1149	21.427	0.3603	0.4180	0.00613	0.38	0.732	16.2	0.85	2.49
889143.	106355.	134353.	0.626	0.678	0.1048	20.229	0.3544	0.4181	0.00589	0.38	0.724	16.5	0.84	2.49
881248.	112627.	139154.	0.614	0.678	0.0967	18.699	0.3490	0.4177	0.00569	0.38	0.722	16.8	0.85	2.48
863627.	127160.	150677.	0.599	0.678	0.0836	15.873	0.3408	0.4170	0.00535	0.38	0.722	17.6	0.85	2.45
844766.	130188.	149694.	0.593	0.678	0.0716	15.062	0.3363	0.4179	0.00496	0.38	0.693	17.8	0.83	2.49
825047.	144856.	162378.	0.590	0.678	0.0642	12.895	0.3331	0.4171	0.00471	0.38	0.696	18.6	0.83	2.46
805055.	153749.	168915.	0.590	0.678	0.0576	11.642	0.3308	0.4172	0.00444	0.38	0.685	19.2	0.83	2.46
785188.	172227.	186025.	0.593	0.676	0.0537	9.812	0.3294	0.4162	0.00426	0.38	0.700	20.1	0.85	2.42
HEAT BALANCE, 0.06 TEST VOLTAGE, 31.8 HEAT INPUT/UNIT AREA, 0.383 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1499165.	214855.	280621.	0.655	0.682	0.0984	16.034	0.3495	0.3769	0.00684	0.38	0.906	23.2	1.04	1.81
1470754.	206218.	257447.	0.629	0.685	0.0789	16.720	0.3350	0.3887	0.00612	0.38	0.835	22.8	0.95	1.94
1437873.	199175.	239649.	0.614	0.687	0.0644	17.244	0.3233	0.4000	0.00552	0.38	0.773	22.5	0.87	2.06
1402384.	203456.	237437.	0.605	0.687	0.0542	16.357	0.3139	0.4031	0.00509	0.38	0.740	22.8	0.84	2.11
1384102.	191687.	220886.	0.602	0.687	0.0488	17.298	0.3098	0.4052	0.00482	0.38	0.699	22.3	0.80	2.19
1365649.	196985.	224276.	0.600	0.687	0.0454	16.497	0.3062	0.4054	0.00467	0.38	0.691	22.6	0.79	2.20
1347145.	198257.	223302.	0.599	0.686	0.0421	16.121	0.3029	0.4060	0.00450	0.38	0.676	22.7	0.78	2.22
1310350.	209873.	231943.	0.598	0.686	0.0369	14.500	0.2972	0.4061	0.00425	0.38	0.663	23.3	0.77	2.22
1274956.	200515.	218299.	0.600	0.685	0.0317	14.920	0.2939	0.4086	0.00393	0.38	0.618	23.1	0.73	2.32
1241675.	226623.	243556.	0.604	0.686	0.0292	12.483	0.2932	0.4069	0.00381	0.38	0.634	24.3	0.75	2.25
1209639.	220205.	234225.	0.600	0.685	0.0253	12.533	0.2931	0.4088	0.00357	0.38	0.599	24.2	0.71	2.32
1178944.	254925.	268609.	0.613	0.686	0.0244	10.144	0.2935	0.4064	0.00350	0.38	0.630	25.7	0.75	2.24
HEAT BALANCE, 0.05 TEST VOLTAGE, 32.0 HEAT INPUT/UNIT AREA, 0.385 ID, 0.507 OD, 0.527 LENGTH, 24.0														
2013707.	366160.	509509.	0.704	0.666	0.1409	11.975	0.3721	0.3392	0.00633	0.38	0.906	32.1	1.08	1.48
1994979.	331035.	441412.	0.670	0.676	0.1147	13.423	0.3575	0.3589	0.00567	0.38	0.814	30.8	0.95	1.63
1970239.	340002.	436172.	0.645	0.678	0.0985	12.836	0.3451	0.3637	0.00530	0.38	0.790	31.0	0.92	1.67
1940984.	322836.	401068.	0.627	0.681	0.0830	13.455	0.3347	0.3747	0.00484	0.38	0.731	30.4	0.85	1.78
1925067.	319566.	391295.	0.621	0.682	0.0768	13.502	0.3300	0.3784	0.00465	0.39	0.712	30.3	0.82	1.82
1908483.	317126.	383121.	0.615	0.683	0.0713	13.500	0.3258	0.3819	0.00448	0.39	0.694	30.2	0.80	1.86
1891360.	321672.	383725.	0.611	0.684	0.0668	13.138	0.3218	0.3832	0.00435	0.39	0.685	30.4	0.79	1.87
1859599.	343361.	400332.	0.605	0.683	0.0598	11.878	0.3148	0.3823	0.00416	0.39	0.684	31.2	0.79	1.86
1819600.	319014.	365085.	0.601	0.686	0.0514	12.904	0.3089	0.3944	0.00381	0.39	0.623	30.5	0.72	2.00
1782887.	357916.	402547.	0.599	0.685	0.0474	10.774	0.3037	0.3881	0.00372	0.39	0.650	31.9	0.75	1.93
1746265.	330677.	366805.	0.598	0.687	0.0411	11.875	0.2993	0.4006	0.00343	0.39	0.595	31.1	0.68	2.07
1710085.	391428.	426394.	0.598	0.685	0.0391	9.167	0.2955	0.3884	0.00342	0.39	0.641	33.3	0.75	1.93
HEAT BALANCE, 0.09 TEST VOLTAGE, 32.0 HEAT INPUT/UNIT AREA, 0.385 ID, 0.507 OD, 0.527 LENGTH, 24.0														
1722728.	370990.	782241.	1.117	0.629	0.6493	9.603	0.4519	0.3516	0.00630	0.38	0.732	38.4	0.82	1.59
1770238.	356280.	709416.	1.060	0.638	0.5458	10.423	0.4454	0.3597	0.00580	0.38	0.699	37.5	0.78	1.64
1809531.	323905.	613091.	0.998	0.651	0.4524	12.027	0.4371	0.3742	0.00543	0.38	0.647	35.9	0.71	1.75
1840943.	334127.	595855.	0.936	0.653	0.3943	11.832	0.4278	0.3767	0.00516	0.38	0.641	36.0	0.71	1.77
1853846.	328809.	571518.	0.907	0.657	0.3648	12.174	0.4230	0.3812	0.00499	0.38	0.625	35.6	0.69	1.80
1864986.	318930.	541297.	0.879	0.660	0.3363	12.734	0.4182	0.3858	0.00480	0.38	0.605	35.1	0.67	1.85
1874441.	329890.	544932.	0.853	0.660	0.3175	12.304	0.4135	0.3853	0.00471	0.38	0.608	35.4	0.68	1.84
1888641.	337463.	531456.	0.806	0.661	0.2799	12.095	0.4044	0.3874	0.00447	0.38	0.598	35.5	0.67	1.87
1897160.	327854.	495651.	0.765	0.666	0.2436	12.616	0.3958	0.3935	0.00419	0.39	0.572	35.0	0.64	1.94
1900681.	347133.	503642.	0.731	0.665	0.2197	11.810	0.3878	0.3928	0.00403	0.38	0.573	35.6	0.65	1.93
1899856.	345470.	484177.	0.702	0.668	0.1949	11.842	0.3805	0.3970	0.00381	0.37	0.555	35.4	0.63	1.98
1895291.	388969.	525925.	0.678	0.664	0.1813	10.257	0.3737	0.3912	0.00375	0.38	0.578	36.9	0.67	1.91

TABLE IV. - Continued. UNIFORMLY

(b) Test section 2; tube inside diameter, 0.438 inch; tube outside

EL	PH	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HPW	H/HF	TW/TB	THETA	ROFM
RUN 1-1210 WEIGHT FLOW, 0.1257 HEAT INPUT, 62.60 INLET BULK TEMP, 51.9 OUTLET BULK TEMP, 170.6 PLOT CH 2															
2.50	268.9	61.4	2.869	41.8	0.021	0.0857	595.	427.	0.00505	5.36	1.93	8.30	6.95	0.007	1.51
4.50	268.6	64.3	2.024	59.2	0.039	0.2176	672.	510.	0.00416	3.16	1.28	5.63	7.94	-0.001	0.68
6.50	268.0	67.4	1.384	66.6	0.058	0.4164	760.	606.	0.00346	2.07	1.42	3.88	9.00	-0.006	0.33
8.50	267.0	73.6	0.987	121.5	0.075	0.6107	884.	741.	0.00282	1.47	1.59	2.83	10.07	-0.015	0.19
9.50	266.4	78.0	0.852	140.7	0.083	0.6903	930.	789.	0.00265	1.33	1.64	2.52	10.12	-0.020	0.16
10.50	265.7	83.1	0.746	160.7	0.091	0.7555	990.	850.	0.00247	1.20	1.65	2.24	10.22	-0.025	0.14
11.50	265.0	88.9	0.662	181.2	0.098	0.8073	989.	849.	0.00249	1.18	1.69	2.07	9.55	-0.033	0.13
13.50	263.6	101.8	0.539	222.3	0.110	0.8794	967.	827.	0.00261	1.18	1.75	1.83	8.13	-0.052	0.12
15.50	261.9	115.4	0.453	264.4	0.123	0.9225	1038.	898.	0.00243	1.07	1.64	1.60	7.78	-0.066	0.10
17.50	260.5	129.4	0.393	305.2	0.134	0.9490	1046.	907.	0.00245	1.05	1.56	1.47	7.01	-0.085	0.10
19.50	259.1	143.8	0.347	345.9	0.146	0.9659	1006.	866.	0.00262	1.07	1.52	1.40	6.03	-0.111	0.10
21.50	257.8	156.8	0.313	383.2	0.156	0.9999	1005.	865.	0.00268	1.06	1.43	1.34	5.52	-0.132	0.09
RUN 2-1212 WEIGHT FLOW, 0.1677 HEAT INPUT, 62.80 INLET BULK TEMP, 51.6 OUTLET BULK TEMP, 128.7 PLOT CH 3															
2.50	257.3	59.5	3.126	51.2	0.023	0.0589	602.	445.	0.00484	4.50	1.74	7.11	7.49	0.010	1.79
4.50	256.9	62.4	2.466	64.8	0.039	0.1319	678.	528.	0.00403	2.87	1.01	5.37	8.45	0.002	0.95
6.50	256.1	64.0	1.840	66.9	0.059	0.2546	756.	612.	0.00344	1.91	0.89	4.00	9.55	-0.001	0.50
8.50	254.8	66.3	1.363	117.3	0.080	0.4108	876.	741.	0.00282	1.30	1.01	2.99	11.18	-0.004	0.27
9.50	254.1	68.1	1.183	135.1	0.090	0.4907	901.	767.	0.00272	1.20	1.11	2.67	11.27	-0.007	0.22
10.50	253.4	70.4	1.036	154.3	0.099	0.5664	961.	829.	0.00252	1.06	1.16	2.38	11.77	-0.010	0.18
11.50	252.6	73.3	0.916	174.6	0.108	0.6350	934.	802.	0.00262	1.07	1.26	2.20	10.93	-0.014	0.17
13.50	250.9	80.6	0.736	217.2	0.125	0.7460	868.	732.	0.00291	1.12	1.44	1.92	9.09	-0.027	0.15
15.50	249.2	89.3	0.611	261.6	0.141	0.8241	903.	767.	0.00280	1.04	1.46	1.69	8.61	-0.039	0.13
17.50	247.3	99.1	0.520	307.3	0.155	0.8774	885.	750.	0.00292	1.04	1.51	1.54	7.57	-0.055	0.12
19.50	245.4	109.4	0.452	353.5	0.168	0.9136	838.	700.	0.00321	1.07	1.56	1.45	6.40	-0.079	0.12
21.50	243.4	119.7	0.401	398.4	0.182	0.9376	839.	701.	0.00326	1.05	1.52	1.37	5.85	-0.098	0.12
RUN 3-1207 WEIGHT FLOW, 0.0950 HEAT INPUT, 51.00 INLET BULK TEMP, 54.6 OUTLET BULK TEMP, 186.4 PLOT CH 4															
2.50	289.4	63.3	2.618	34.6	0.019	0.1233	492.	360.	0.00510	6.23	1.95	8.66	5.69	0.005	1.38
4.50	289.2	66.6	1.784	50.8	0.033	0.2965	548.	419.	0.00431	3.81	1.61	5.69	6.29	-0.005	0.65
6.50	288.9	71.6	1.222	74.1	0.047	0.5113	625.	501.	0.00356	2.48	1.84	3.78	7.00	-0.016	0.35
8.50	288.3	80.3	0.889	101.9	0.059	0.6916	721.	603.	0.00294	1.80	1.92	2.75	7.51	-0.030	0.22
9.50	288.0	85.9	0.776	116.8	0.064	0.7589	756.	640.	0.00278	1.62	1.94	2.44	7.45	-0.038	0.19
10.50	287.6	92.2	0.686	132.0	0.069	0.8120	830.	719.	0.00247	1.43	1.87	2.17	7.80	-0.044	0.16
11.50	287.2	94.0	0.614	147.4	0.074	0.8532	814.	702.	0.00256	1.42	1.92	2.04	7.39	-0.057	0.15
13.50	286.2	113.5	0.509	178.1	0.083	0.9086	832.	721.	0.00255	1.35	1.89	1.82	6.35	-0.080	0.14
15.50	285.3	128.3	0.436	208.0	0.092	0.9413	921.	815.	0.00227	1.19	1.68	1.60	6.35	-0.093	0.12
17.50	284.4	143.7	0.381	237.9	0.100	0.9615	950.	844.	0.00223	1.13	1.57	1.47	5.87	-0.113	0.11
19.50	283.4	157.9	0.341	265.3	0.108	0.9999	926.	820.	0.00235	1.14	1.49	1.41	5.19	-0.141	0.11
21.50	282.3	172.1	0.310	292.5	0.115	0.9999	941.	835.	0.00235	1.11	1.39	1.34	4.85	-0.162	0.10
RUN 9-1192 WEIGHT FLOW, 0.1065 HEAT INPUT, 39.20 INLET BULK TEMP, 51.0 OUTLET BULK TEMP, 80.8 PLOT CH *															
2.50	315.6	56.6	3.578	49.7	0.018	0.0357	403.	298.	0.00486	4.50	1.71	5.41	5.26	0.039	2.84
4.50	314.8	60.1	3.255	54.6	0.023	0.0592	439.	334.	0.00428	3.61	1.33	4.60	5.57	0.021	2.25
6.50	314.0	62.7	2.916	61.0	0.029	0.0929	460.	356.	0.00401	3.02	1.07	4.02	5.68	0.011	1.73
8.50	313.1	64.6	2.567	69.3	0.038	0.1400	502.	400.	0.00352	2.33	0.84	3.33	6.19	0.004	1.26
9.50	312.7	65.3	2.332	74.3	0.043	0.1676	505.	402.	0.00350	2.18	0.78	3.14	6.16	0.002	1.10
10.50	312.3	66.0	2.223	80.0	0.048	0.2026	540.	439.	0.00317	1.82	0.73	2.77	6.66	-0.000	0.90
11.50	311.9	66.7	2.063	86.2	0.053	0.2381	551.	450.	0.00308	1.67	0.72	2.57	6.75	-0.002	0.78
13.50	311.1	68.2	1.774	100.7	0.063	0.3162	600.	502.	0.00274	1.33	0.69	2.15	7.36	-0.006	0.57
15.50	310.2	70.0	1.527	115.4	0.074	0.4007	642.	546.	0.00250	1.11	0.71	1.84	7.80	-0.009	0.43
17.50	309.4	72.2	1.323	134.4	0.083	0.4850	679.	584.	0.00233	0.96	0.75	1.61	8.10	-0.013	0.34
19.50	308.6	75.1	1.157	153.7	0.093	0.5641	662.	566.	0.00243	0.95	0.81	1.48	7.54	-0.019	0.30
21.50	307.7	78.5	1.021	174.2	0.102	0.6355	678.	584.	0.00236	0.87	0.85	1.34	7.43	-0.026	0.26
RUN 10-1202 WEIGHT FLOW, 0.1080 HEAT INPUT, 37.30 INLET BULK TEMP, 57.3 OUTLET BULK TEMP, 131.4 PLOT CH A															
2.50	319.4	63.3	2.853	36.1	0.018	0.1020	449.	351.	0.00386	4.37	1.54	5.79	5.55	0.010	1.67
4.50	319.0	66.0	2.293	44.9	0.026	0.1917	496.	399.	0.00335	3.10	1.15	4.42	6.04	0.000	1.02
6.50	318.5	68.5	1.805	57.1	0.036	0.3125	520.	424.	0.00314	2.42	1.13	3.51	6.18	-0.007	0.67
8.50	318.1	71.8	1.428	72.2	0.045	0.4485	615.	523.	0.00249	1.64	1.13	2.57	7.29	-0.013	0.41
9.50	317.9	73.9	1.277	80.7	0.049	0.5148	618.	526.	0.00248	1.55	1.19	2.36	7.12	-0.017	0.36
10.50	317.6	76.4	1.150	89.6	0.053	0.5769	655.	565.	0.00231	1.38	1.20	2.12	7.40	-0.021	0.30
11.50	317.4	79.3	1.042	98.8	0.057	0.6337	677.	589.	0.00222	1.27	1.23	1.94	7.42	-0.026	0.27
13.50	316.9	86.0	0.871	118.2	0.065	0.7292	694.	605.	0.00217	1.16	1.28	1.69	7.04	-0.038	0.23
15.50	316.5	93.9	0.745	138.2	0.071	0.8013	760.	675.	0.00195	1.00	1.25	1.46	7.19	-0.048	0.19
17.50	316.1	102.6	0.649	158.7	0.078	0.8542	773.	688.	0.00194	0.96	1.26	1.33	6.70	-0.063	0.17
19.50	315.6	111.8	0.576	178.9	0.084	0.8917	742.	656.	0.00208	0.97	1.30	1.27	5.86	-0.084	0.17
21.50	315.1	121.1	0.518	199.6	0.090	0.9183	754.	669.	0.00207	0.94	1.26	1.19	5.52	-0.101	0.16
RUN 11-1188 WEIGHT FLOW, 0.1050 HEAT INPUT, 16.60 INLET BULK TEMP, 56.3 OUTLET BULK TEMP, 76.3 PLOT CH B															
2.50	322.6	59.7	3.320	30.2	0.012	0.0550	258.	212.	0.00329	4.08	1.37	4.58	3.55	0.044	2.73
4.50	322.2	61.3	3.070	32.6	0.015	0.0781	285.	239.	0.00283	3.44	1.04	4.00	3.86	0.025	2.29
6.50	321.9	63.6	2.812	35.6	0.018	0.1079	304.	259.	0.00257	2.94	0.87	3.51	4.07	0.014	1.90
8.50	321.6	65.0	2.551	39.2	0.021	0.1458	341.	296.	0.00217	2.31	0.70	2.90	4.56	0.005	1.49
9.50	321.4	65.6	2.421	41.4	0.024	0.1682	336.	291.	0.00223	2.27	0.67	2.84	4.43	0.003	1.38
10.50	321.2	66.1	2.294	43.6	0.026	0.1927	360.	316.	0.00202	1.96	0.62	2.52	4.77	0.000	1.20
11.50	321.1	66.7	2.171	46.1	0.028	0.2186	363.	318.	0.00200	1.86	0.62	2.40	4.77	-0.002	1.09
13.50	320.7	67.9	1.943	51.5	0.032	0.2743	369.	325.	0.00190	1.68	0.62	2.17	4.79	-0.006	0.91
15.50	320.4	69.1	1.738	57.6	0.036	0.3348	418.	375.	0.00165	1.29	0.59	1.74	5.42	-0.010	0.70
17.50	320.1	70.5	1.557	64.3	0.040	0.3981	437.	394.	0.00156	1.13	0.59	1.54	5.59	-0.013	0.58
19.50	319.7	72.2	1.400	71.5	0.044	0.4612	434.	391.	0.00159	1.08	0.63	1.44	5.41	-0.019	0.51
21.50	319.4	74.3	1.264	79.2	0.048	0.5220	457.	414.	0.00149	0.95	0.64	1.27	5.58	-0.024	0.44

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.502 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-R	PHI-F	EFLUX	U <sub>Q</sub> DL	H/H-H	SIMPLL	NU/NUT	TOLK
HEAT BALANCE, 0.02 TEST VOLTAGE, 37.2 HEAT INPUT/UNIT AREA, 1.894 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1324661.	90952.	670109.	1.950	0.684	2.0716	37.624	0.4714	0.3864	0.04844	1.85	2.373	33.8	1.73	1.86
1983817.	97702.	380492.	2.786	0.686	0.7058	53.878	0.6541	0.4054	0.03448	1.85	2.167	31.7	1.95	2.13
2423864.	109005.	247295.	1.444	0.684	0.2810	60.112	0.5259	0.4118	0.02356	1.87	1.968	29.7	2.05	2.39
2566475.	109911.	175846.	0.816	0.685	0.1263	63.673	0.4090	0.4098	0.01663	1.88	1.708	28.1	1.96	2.67
2554808.	112509.	140367.	0.706	0.698	0.0901	60.966	0.3740	0.4044	0.01438	1.89	1.616	28.0	1.91	2.75
2507449.	113529.	148536.	0.647	0.694	0.0657	59.414	0.3482	0.4037	0.01262	1.89	1.498	27.9	1.82	2.87
2437803.	126558.	155328.	0.617	0.693	0.0511	51.281	0.3292	0.4037	0.01134	1.89	1.437	28.9	1.76	2.88
2270402.	157272.	177694.	0.598	0.694	0.0335	37.394	0.3045	0.4037	0.00945	1.89	1.337	31.3	1.66	2.87
2105230.	160482.	173163.	0.603	0.689	0.0227	33.727	0.2954	0.4036	0.00805	1.90	1.185	32.0	1.51	3.01
1957598.	177557.	186377.	0.617	0.688	0.0172	27.768	0.2958	0.4036	0.00709	1.90	1.100	33.7	1.42	3.05
1827684.	208836.	215401.	0.629	0.690	0.0143	21.315	0.2992	0.4036	0.00637	1.90	1.062	36.3	1.37	3.01
1723834.	225719.	225742.	0.643	0.689	0.0001	18.198	0.3101	0.4036	0.00584	1.90	1.014	38.0	1.34	3.04
HEAT BALANCE, 0.04 TEST VOLTAGE, 37.2 HEAT INPUT/UNIT AREA, 1.911 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1526131.	100831.	952842.	1.676	0.685	2.8439	39.863	0.4302	0.3913	0.04043	1.87	1.884	41.1	1.23	1.89
2189121.	97957.	576684.	3.250	0.686	1.1785	59.966	0.6646	0.4060	0.03194	1.88	1.713	38.7	1.36	2.12
2851041.	104162.	367612.	2.983	0.684	0.5277	74.806	0.6846	0.4116	0.02388	1.89	1.577	36.4	1.50	2.36
3289702.	103305.	240120.	1.529	0.683	0.2518	88.472	0.5397	0.4105	0.01760	1.90	1.447	33.6	1.55	2.64
3413401.	110895.	218635.	1.134	0.691	0.1851	84.779	0.4781	0.4074	0.01541	1.90	1.415	33.5	1.57	2.69
3480661.	110494.	190594.	0.913	0.696	0.1357	86.466	0.4327	0.4036	0.01350	1.91	1.348	32.7	1.56	2.80
3499989.	130434.	201623.	0.783	0.697	0.1073	72.913	0.3980	0.4041	0.01217	1.91	1.339	34.0	1.56	2.76
3432910.	165588.	245598.	0.657	0.685	0.0716	49.719	0.3503	0.4097	0.01024	1.90	1.311	37.3	1.55	2.68
3283685.	149595.	240146.	0.612	0.697	0.0472	43.149	0.3211	0.4049	0.00859	1.90	1.210	38.3	1.46	2.75
3104819.	237758.	269219.	0.600	0.694	0.0341	33.554	0.3027	0.4058	0.00750	1.90	1.149	40.8	1.40	2.74
2925300.	297772.	324175.	0.601	0.684	0.0265	24.705	0.2918	0.4100	0.00673	1.90	1.117	44.4	1.36	2.68
2763657.	324620.	344638.	0.611	0.687	0.0208	20.888	0.2908	0.4088	0.00607	1.90	1.064	46.4	1.31	2.69
HEAT BALANCE, 0.02 TEST VOLTAGE, 33.7 HEAT INPUT/UNIT AREA, 1.548 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1139741.	102973.	559332.	2.240	0.674	1.6252	26.757	0.5499	0.3651	0.04813	1.51	2.651	29.9	2.20	1.71
1614570.	119627.	351645.	2.081	0.682	0.5638	33.644	0.5936	0.3867	0.03359	1.52	2.466	28.4	2.43	1.89
1849631.	131919.	245044.	1.021	0.686	0.2295	36.172	0.4556	0.4061	0.02282	1.53	2.188	26.9	2.33	2.17
1872445.	134433.	190043.	0.700	0.683	0.1076	36.358	0.3744	0.4130	0.01617	1.54	1.856	26.0	2.10	2.44
1835747.	138929.	180097.	0.642	0.682	0.0784	34.419	0.3491	0.4150	0.01404	1.54	1.726	26.1	2.00	2.54
1782073.	129394.	157504.	0.613	0.684	0.0571	35.938	0.3304	0.4105	0.01225	1.55	1.558	25.5	1.87	2.68
1719644.	147773.	171518.	0.599	0.682	0.0458	29.899	0.3164	0.4117	0.01113	1.55	1.511	26.8	1.82	2.67
1591609.	164560.	179853.	0.597	0.690	0.0306	24.004	0.3019	0.4079	0.00931	1.55	1.383	28.3	1.70	2.72
1475006.	154704.	163495.	0.610	0.693	0.0213	23.456	0.3006	0.4039	0.00791	1.56	1.207	28.3	1.53	2.90
1371506.	163449.	169194.	0.624	0.690	0.0169	20.276	0.3033	0.4039	0.00697	1.56	1.109	29.4	1.43	2.97
1289022.	184600.	164618.	0.639	0.691	0.0001	16.349	0.3145	0.4039	0.00636	1.56	1.075	31.3	1.41	2.96
1217300.	193218.	193235.	0.652	0.690	0.0001	14.476	0.3265	0.4038	0.00583	1.56	1.019	32.4	1.34	3.01
HEAT BALANCE, 0.06 TEST VOLTAGE, 29.3 HEAT INPUT/UNIT AREA, 1.182 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1275198.	218440.	1850558.	1.311	0.650	6.1693	13.912	0.3340	0.3345	0.02275	1.17	1.332	53.3	0.82	1.70
1559032.	199015.	1497033.	1.457	0.664	3.6150	18.839	0.3907	0.3532	0.02106	1.17	1.245	51.6	0.85	1.70
1899822.	200129.	1240823.	1.688	0.671	2.2602	22.891	0.4583	0.3646	0.01926	1.18	1.197	51.3	0.91	1.72
2281790.	190077.	954484.	2.096	0.678	1.4080	29.532	0.5405	0.3812	0.01695	1.18	1.124	49.2	0.93	1.82
2478903.	201029.	887077.	2.288	0.679	1.1441	30.361	0.5765	0.3823	0.01601	1.18	1.121	49.3	0.97	1.84
2668469.	189450.	747329.	2.191	0.682	0.8997	35.945	0.5798	0.3343	0.01468	1.18	1.068	47.4	0.95	1.95
2842697.	196167.	686086.	2.043	0.683	0.7380	37.072	0.5739	0.3973	0.01370	1.18	1.054	47.1	0.97	1.99
3138464.	193050.	542897.	1.785	0.685	0.4919	42.256	0.5574	0.4068	0.01168	1.19	0.992	45.1	0.96	2.15
3359514.	196374.	453413.	1.389	0.684	0.3391	44.927	0.5118	0.4095	0.01002	1.19	0.942	43.8	0.96	2.26
3504056.	202472.	395740.	1.075	0.683	0.2415	45.740	0.4643	0.4119	0.00866	1.19	0.895	43.0	0.95	2.37
3581531.	240696.	409368.	0.882	0.684	0.1854	38.812	0.4263	0.4110	0.00778	1.19	0.897	44.5	0.98	2.34
3604911.	257750.	393219.	0.764	0.683	0.1498	36.369	0.3965	0.4122	0.00691	1.19	0.863	44.9	0.96	2.39
HEAT BALANCE, 0.02 TEST VOLTAGE, 28.7 HEAT INPUT/UNIT AREA, 1.127 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1137839.	122587.	713003.	1.716	0.669	2.0937	22.245	0.4689	0.3629	0.03055	1.11	1.760	33.5	1.38	1.71
1496722.	125210.	502691.	2.174	0.678	1.0158	29.192	0.5727	0.3817	0.02468	1.11	1.647	32.2	1.47	1.83
1792907.	143930.	400257.	1.748	0.681	0.5504	31.088	0.5512	0.3905	0.02002	1.12	1.593	31.8	1.57	1.93
1976682.	132150.	274889.	1.182	0.684	0.2951	38.752	0.4909	0.4085	0.01526	1.12	1.396	29.3	1.45	2.22
2027309.	145380.	267468.	0.985	0.684	0.2327	35.953	0.4474	0.4088	0.01383	1.12	1.377	29.6	1.47	2.24
2054797.	144207.	239935.	0.853	0.683	0.1802	36.990	0.4197	0.4112	0.01232	1.13	1.302	29.0	1.43	2.34
2062888.	148764.	227305.	0.763	0.683	0.1437	36.008	0.3969	0.4128	0.01114	1.13	1.249	29.0	1.39	2.41
2035401.	167471.	224700.	0.661	0.682	0.0973	31.214	0.3617	0.4142	0.00940	1.13	1.176	29.8	1.35	2.47
1970920.	163680.	201281.	0.615	0.680	0.0662	31.043	0.3370	0.4142	0.00793	1.13	1.051	29.5	1.24	2.62
1888537.	179145.	207382.	0.596	0.679	0.0491	26.777	0.3196	0.4134	0.00696	1.14	0.968	30.5	1.19	2.66
1802655.	211928.	233376.	0.593	0.680	0.0393	20.956	0.3099	0.4142	0.00630	1.13	0.969	32.6	1.17	2.62
1720560.	223924.	241843.	0.599	0.679	0.0316	18.647	0.3070	0.4134	0.00570	1.13	0.917	33.6	1.12	2.66
HEAT BALANCE, 0.03 TEST VOLTAGE, 19.2 HEAT INPUT/UNIT AREA, 0.503 ID, 0.438 OD, 0.502 LENGTH, 24.0														
842808.	217154.	1281907.	1.412	0.610	4.7434	8.378	0.3776	0.3082	0.01655	0.50	1.025	41.0	0.82	1.60
978938.	195074.	1088995.	1.556	0.624	3.3140	11.030	0.4251	0.3140	0.01581	0.50	0.975	39.3	0.82	1.55
1130504.	188129.	941496.	1.740	0.636	2.3117	13.354	0.4762	0.3222	0.01483	0.50	0.947	38.3	0.84	1.53
1291846.	169807.	756176.	2.042	0.652	1.5868	17.377	0.5364	0.3381	0.01358	0.50	0.895	36.2	0.82	1.57
1373799.	183023.	742593.	2.172	0.650	1.3747	17.018	0.5620	0.3360	0.01312	0.50	0.908	36.7	0.87	1.54
1453651.	171414.	650279.	2.147	0.659	1.1379	19.576	0.5698	0.3478	0.01234	0.50	0.872	35.4	0.84	1.60
1529228.	178567.	622068.	2.034	0.660	0.9829	19.757	0.5660	0.3492	0.01181	0.50	0.872	35.4	0.86	1.60
1664131.	192534.	570967.	1.958	0.663	0.7430	19.940	0.5583	0.3528	0.01077	0.50	0.867	35.3	0.87	1.61
1776356.	174349.	451480.	1.646	0.675	0.5355	24.211	0.5405	0.3751	0.00941	0.50	0.795	33.2	0.82	1.78
1864506.	179893.	400061.	1.372	0.678	0.4097	24.786	0.5079	0.3817	0.00844	0.51	0.772	32.7	0.81	1.84
1928872.	201061.	400296.	1.137	0.677	0.3270	22.754	0.4736	0.3812	0.00774	0.51	0.774	33.2	0.83	1.84
1971382.	203065.	364375.	0.967	0.680	0.2562	23.473	0.4437	0.3893	0.00694	0.51	0.740	32.7	0.80	1.92

TABLE IV. - Continued. UNIFORMLY

(b) Continued. Test section 2; tube inside diameter, 0.438 inch; tube outside

EL	PB	T <sub>B</sub>	ROB	VELOC	M	X2	T <sub>O</sub>	T <sub>W</sub>	H	H/HNK	H/HM <sub>w</sub>	H/HF	T <sub>W</sub> /T <sub>B</sub>	THETA	ROFM
RUN 13-1215 WEIGHT FLOW, 0.0990 HEAT INPUT, 62.30 INLET BULK TEMP, 55.5 OUTLET BULK TEMP, 213.6 PLOT CH D															
2.50	517.7	69.8	2.887	32.7	0.014	0.1465	552.	387.	0.00581	5.27	2.84	6.47	5.54	0.016	1.69
4.50	517.3	78.0	2.124	44.4	0.023	0.3280	604.	442.	0.00508	3.65	2.31	4.72	5.67	-0.008	0.90
6.50	516.8	87.0	1.565	60.3	0.031	0.5337	662.	505.	0.00444	2.70	2.22	3.54	5.80	-0.029	0.55
8.50	516.4	98.9	1.198	78.8	0.038	0.6997	745.	594.	0.00376	2.08	2.12	2.73	6.01	-0.048	0.37
9.50	516.2	105.8	1.066	88.6	0.041	0.7612	756.	606.	0.00373	1.95	2.13	2.51	5.73	-0.062	0.34
10.50	516.0	113.1	0.960	98.3	0.044	0.8089	816.	672.	0.00336	1.74	2.01	2.26	5.94	-0.069	0.29
11.50	515.8	120.7	0.874	108.0	0.047	0.8458	850.	708.	0.00320	1.64	1.93	2.12	5.87	-0.078	0.26
13.50	515.4	136.8	0.741	127.5	0.053	0.9819	962.	721.	0.00322	1.56	1.86	1.93	5.27	-0.106	0.22
15.50	515.0	152.9	0.646	146.1	0.058	0.9999	942.	805.	0.00289	1.39	1.66	1.71	5.27	-0.120	0.20
17.50	514.5	168.8	0.576	163.9	0.063	0.9999	1030.	894.	0.00262	1.24	1.47	1.54	5.30	-0.130	0.18
19.50	514.1	184.4	0.521	181.1	0.068	0.9999	1030.	894.	0.00268	1.22	1.38	1.47	4.85	-0.154	0.18
21.50	513.7	199.2	0.479	197.0	0.072	0.9999	1086.	951.	0.00254	1.14	1.26	1.36	4.77	-0.166	0.16
RUN 14-1214 WEIGHT FLOW, 0.1270 HEAT INPUT, 62.50 INLET BULK TEMP, 55.1 OUTLET BULK TEMP, 174.5 PLOT CH E															
2.50	530.3	67.2	3.150	38.4	0.015	0.1067	543.	382.	0.00590	4.64	2.58	5.60	5.69	0.026	2.04
4.50	529.9	74.3	2.517	48.1	0.023	0.2257	586.	429.	0.00526	3.46	2.01	4.43	5.77	0.003	1.23
6.50	529.3	80.7	1.970	61.5	0.031	0.3834	635.	481.	0.00467	2.61	1.82	3.45	5.96	-0.013	0.76
8.50	528.9	88.2	1.558	77.7	0.039	0.5433	710.	562.	0.00397	2.00	1.72	2.72	6.37	-0.027	0.50
9.50	528.6	92.6	1.398	86.6	0.043	0.6140	703.	555.	0.00406	1.93	1.78	2.55	5.99	-0.037	0.45
10.50	528.3	97.5	1.262	95.9	0.046	0.6760	771.	628.	0.00356	1.66	1.68	2.24	6.44	-0.042	0.37
11.50	528.1	102.7	1.148	105.5	0.049	0.7289	762.	618.	0.00366	1.62	1.73	2.12	6.01	-0.053	0.35
13.50	527.6	114.1	0.971	124.7	0.056	0.8089	799.	658.	0.00347	1.46	1.67	1.88	5.77	-0.071	0.30
15.50	527.1	126.2	0.841	143.9	0.062	0.8624	887.	753.	0.00304	1.29	1.52	1.66	5.96	-0.081	0.25
17.50	526.6	139.1	0.742	163.3	0.067	0.9881	927.	795.	0.00291	1.19	1.44	1.51	5.72	-0.097	0.21
19.50	526.1	151.7	0.667	181.7	0.073	0.9999	926.	794.	0.00297	1.17	1.38	1.43	5.23	-0.119	0.20
21.50	525.6	164.1	0.608	199.3	0.078	0.9999	959.	828.	0.00288	1.10	1.27	1.34	5.04	-0.134	0.19
RUN 15-1213 WEIGHT FLOW, 0.1660 HEAT INPUT, 63.40 INLET BULK TEMP, 49.6 OUTLET BULK TEMP, 139.2 PLOT CH F															
2.50	515.8	60.9	3.590	44.1	0.015	0.0525	554.	389.	0.00573	4.20	2.53	5.00	6.39	0.042	2.70
4.50	515.2	67.6	3.083	51.3	0.021	0.1142	601.	433.	0.00508	3.27	1.89	4.17	6.50	0.020	1.82
6.50	514.7	72.9	2.582	61.3	0.029	0.2060	645.	487.	0.00457	2.55	1.53	3.46	6.68	0.005	1.18
8.50	514.1	77.8	2.126	74.4	0.038	0.3257	700.	547.	0.00405	2.01	1.37	2.86	7.03	-0.006	0.77
9.50	513.8	80.3	1.931	82.0	0.042	0.3896	729.	578.	0.00383	1.80	1.33	2.60	7.19	-0.011	0.64
10.50	513.5	83.0	1.755	90.2	0.046	0.4541	764.	615.	0.00359	1.60	1.30	2.36	7.41	-0.016	0.53
11.50	513.2	86.0	1.600	98.9	0.051	0.5167	773.	626.	0.00354	1.51	1.31	2.19	7.28	-0.021	0.47
13.50	512.6	92.7	1.346	117.6	0.058	0.6287	781.	633.	0.00353	1.39	1.35	1.94	6.83	-0.033	0.39
15.50	512.0	100.5	1.152	137.4	0.065	0.7190	854.	713.	0.00314	1.20	1.30	1.67	7.09	-0.042	0.31
17.50	511.4	109.3	1.002	157.0	0.072	0.7880	892.	754.	0.00299	1.11	1.27	1.53	6.89	-0.054	0.27
19.50	510.9	118.4	0.899	178.0	0.079	0.8378	872.	733.	0.00313	1.09	1.28	1.44	6.19	-0.071	0.26
21.50	510.3	128.0	0.798	198.3	0.085	0.8743	884.	745.	0.00312	1.05	1.25	1.35	5.82	-0.087	0.24
RUN 16-1205 WEIGHT FLOW, 0.0950 HEAT INPUT, 38.50 INLET BULK TEMP, 53.9 OUTLET BULK TEMP, 150.7 PLOT CH G															
2.50	529.7	64.7	3.349	27.0	0.010	0.0798	404.	309.	0.00489	4.95	2.59	5.60	4.64	0.046	2.54
4.50	529.3	71.0	2.813	32.2	0.014	0.1625	437.	334.	0.00439	3.90	2.00	4.59	4.70	0.017	1.74
6.50	528.8	76.4	2.310	39.2	0.019	0.2785	441.	339.	0.00440	3.36	1.81	3.98	4.43	-0.004	1.24
8.50	528.4	81.9	1.887	48.0	0.024	0.4124	503.	402.	0.00362	2.44	1.62	3.00	4.91	-0.020	0.82
9.50	528.2	84.9	1.710	53.0	0.027	0.4796	475.	374.	0.00400	2.51	1.73	2.99	4.40	-0.033	0.77
10.50	528.0	88.2	1.556	58.2	0.029	0.5437	515.	415.	0.00355	2.12	1.65	2.57	4.71	-0.039	0.64
11.50	527.8	91.8	1.421	63.7	0.032	0.6028	561.	463.	0.00314	1.80	1.57	2.23	5.04	-0.044	0.53
13.50	527.4	99.9	1.204	75.3	0.036	0.7027	542.	443.	0.00339	1.75	1.68	2.08	4.43	-0.072	0.48
15.50	527.0	109.1	1.039	87.2	0.040	0.7785	617.	521.	0.00284	1.44	1.53	1.74	4.78	-0.082	0.38
17.50	526.5	118.7	0.915	99.0	0.044	0.8326	657.	564.	0.00263	1.29	1.45	1.55	4.75	-0.097	0.33
19.50	526.1	128.9	0.817	110.9	0.047	0.8715	642.	547.	0.00280	1.28	1.47	1.49	4.25	-0.128	0.32
21.50	525.7	139.5	0.737	122.9	0.051	0.9892	729.	639.	0.00236	1.10	1.30	1.30	4.58	-0.129	0.25
RUN 17-1218 WEIGHT FLOW, 0.0977 HEAT INPUT, 38.40 INLET BULK TEMP, 54.1 OUTLET BULK TEMP, 151.1 PLOT CH H															
2.50	730.6	65.9	3.580	26.0	0.009	0.0643	406.	303.	0.00486	3.95	2.77	4.30	4.59	0.078	2.78
4.50	730.2	73.5	3.119	29.9	0.011	0.1362	473.	372.	0.00387	2.97	2.03	3.39	5.06	0.036	2.10
6.50	729.9	80.2	2.682	34.7	0.014	0.2312	424.	321.	0.00478	3.14	2.04	3.52	4.00	0.017	1.71
8.50	729.6	86.7	2.289	40.7	0.018	0.3448	584.	487.	0.00290	1.88	1.46	2.32	5.62	-0.006	1.03
9.50	729.4	90.0	2.115	44.1	0.020	0.4040	475.	374.	0.00406	2.33	1.74	2.67	4.16	-0.020	1.09
10.50	729.2	93.4	1.957	47.6	0.021	0.4618	466.	367.	0.00422	2.29	1.77	2.60	3.93	-0.033	1.00
11.50	729.1	97.0	1.815	51.3	0.023	0.5175	568.	400.	0.00373	1.97	1.65	2.27	4.20	-0.041	0.85
13.50	728.7	104.6	1.573	59.2	0.026	0.6179	538.	439.	0.00347	1.70	1.59	1.97	4.19	-0.061	0.70
15.50	728.4	112.9	1.363	67.4	0.029	0.6969	555.	456.	0.00338	1.57	1.56	1.80	4.04	-0.084	0.60
17.50	728.1	121.8	1.232	75.6	0.032	0.7555	687.	595.	0.00248	1.20	1.29	1.43	4.88	-0.079	0.45
19.50	727.7	131.2	1.109	84.0	0.034	0.9968	589.	491.	0.00323	1.37	1.47	1.55	3.74	-0.130	0.42
21.50	727.4	141.0	1.008	92.5	0.037	0.9999	725.	635.	0.00238	1.08	1.21	1.25	4.50	-0.115	0.34
RUN 19-1217 WEIGHT FLOW, 0.1670 HEAT INPUT, 36.40 INLET BULK TEMP, 49.7 OUTLET BULK TEMP, 102.0 PLOT CH J															
2.50	715.3	57.2	3.999	39.8	0.012	0.0232	549.	456.	0.00273	1.81	1.61	2.09	7.97	0.066	3.49
4.50	715.1	62.5	3.745	42.5	0.013	0.0453	665.	577.	0.00213	1.45	1.23	1.42	9.23	0.041	2.79
6.50	714.9	67.2	3.485	45.7	0.016	0.0782	716.	631.	0.00195	1.27	1.04	1.69	9.39	0.029	2.20
8.50	714.6	71.4	3.224	49.4	0.018	0.1162	808.	727.	0.00167	1.07	0.87	1.54	10.18	0.019	1.65
9.50	714.5	73.4	3.095	51.5	0.020	0.1394	755.	672.	0.00184	1.09	0.87	1.53	9.15	0.017	1.54
10.50	714.3	75.3	2.968	53.7	0.021	0.1643	776.	694.	0.00178	1.03	0.82	1.47	9.22	0.013	1.36
11.50	714.2	77.2	2.844	56.0	0.023	0.1908	746.	663.	0.00188	1.03	0.81	1.45	8.59	0.011	1.27
13.50	714.0	80.8	2.606	61.1	0.026	0.2482	638.	550.	0.00234	1.14	0.88	1.48	6.80	0.006	1.19
15.50	713.7	84.3	2.383	66.8	0.029	0.3118	688.	602.	0.00212	0.99	0.79	1.34	7.14	-0.001	0.95
17.50	713.5	87.9	2.178	73.1	0.033	0.3780	684.	597.	0.00216	0.95	0.78	1.26	6.79	-0.008	0.82
19.50	713.2	91.6	1.995	79.8	0.036	0.4435	636.	547.	0.00240	0.97	0.82	1.24	5.38	-0.018	0.77
21.50	713.0	95.4	1.831	87.0	0.039	0.5067	639.	551.	0.00241	0.93	0.82	1.17	5.77	-0.026	0.69

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.502 inch; heated tube length, 24 inches; material, Inconel

RC-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q <sub>DL</sub>	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.03 TEST VOLTAGE, 37.1 HEAT INPUT/UNIT AREA, 1.874 ID, 0.438 OD, 0.502 LENGTH, 24.0														
989730.	147723.	597543.	1.251	0.659	1.7478	15.653	0.4100	0.3923	0.03508	1.84	2.764	31.3	2.20	1.87
1363491.	161399.	399733.	1.133	0.670	0.6492	20.218	0.4462	0.4095	0.02634	1.85	2.488	31.0	2.38	2.07
1547412.	176351.	301333.	0.854	0.674	0.2902	21.119	0.4114	0.4164	0.01942	1.85	2.215	30.6	2.37	2.27
1569011.	177063.	241574.	0.671	0.675	0.1488	21.533	0.3715	0.4203	0.01451	1.86	1.893	30.1	2.17	2.51
1545431.	170359.	240987.	0.627	0.675	0.1155	19.502	0.3566	0.4211	0.01296	1.87	1.808	30.8	2.11	2.56
1511001.	179772.	215968.	0.605	0.674	0.0894	20.388	0.3479	0.4183	0.01152	1.87	1.644	30.2	1.98	2.69
1470790.	178695.	206228.	0.594	0.686	0.0732	19.759	0.3427	0.4121	0.01043	1.88	1.551	30.4	1.91	2.73
1383907.	198082.	201066.	0.591	0.694	0.0107	16.225	0.3372	0.4081	0.00889	1.88	1.447	32.1	1.91	2.79
1302529.	188394.	186411.	0.602	0.690	0.0001	16.061	0.3406	0.4061	0.00771	1.89	1.282	32.1	1.71	2.96
1230251.	178134.	178149.	0.617	0.685	0.0001	16.093	0.3695	0.4057	0.00688	1.90	1.146	32.0	1.54	3.13
1166600.	191844.	191859.	0.631	0.684	0.0002	13.834	0.3601	0.4056	0.00629	1.90	1.098	33.5	1.47	3.16
1112654.	187677.	187694.	0.643	0.681	0.0001	13.443	0.3718	0.4080	0.00584	1.91	1.022	33.7	1.36	3.29
HEAT BALANCE, 0.04 TEST VOLTAGE, 37.1 HEAT INPUT/UNIT AREA, 1.887 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1109673.	182170.	853851.	1.241	0.657	2.4534	14.196	0.3902	0.3913	0.02892	1.86	2.325	37.7	1.69	1.86
1506883.	188853.	601012.	1.232	0.667	1.0507	19.125	0.4395	0.4056	0.02354	1.86	2.117	37.4	1.84	2.00
1820665.	200273.	444005.	1.048	0.673	0.5099	21.993	0.4376	0.4161	0.01854	1.87	1.933	36.8	1.90	2.19
1972944.	198589.	336170.	0.837	0.675	0.2700	24.425	0.4079	0.4189	0.01441	1.88	1.705	35.6	1.84	2.40
1999014.	222952.	339470.	0.732	0.674	0.2129	21.730	0.3913	0.4188	0.01315	1.88	1.681	36.7	1.86	2.41
2001032.	204362.	287738.	0.691	0.675	0.1606	24.157	0.3768	0.4215	0.01155	1.89	1.525	35.4	1.74	2.58
1985346.	227162.	298835.	0.648	0.675	0.1324	21.220	0.3644	0.4217	0.01064	1.89	1.499	36.7	1.74	2.58
1922878.	239123.	286833.	0.605	0.674	0.0918	19.347	0.3486	0.4191	0.00901	1.89	1.369	37.4	1.65	2.67
1841697.	219239.	248505.	0.592	0.695	0.0667	20.093	0.3416	0.4070	0.00765	1.90	1.222	36.8	1.52	2.79
1754952.	224760.	226982.	0.592	0.692	0.0072	18.502	0.3352	0.4063	0.00676	1.91	1.123	37.6	1.50	2.91
1674423.	244713.	244736.	0.601	0.691	0.0001	15.854	0.3411	0.4062	0.00613	1.91	1.075	39.3	1.43	2.94
1601149.	247966.	247987.	0.612	0.689	0.0001	14.823	0.3478	0.4060	0.00562	1.91	1.008	40.0	1.34	3.02
HEAT BALANCE, 0.02 TEST VOLTAGE, 37.2 HEAT INPUT/UNIT AREA, 1.909 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1109010.	203179.	1300806.	1.219	0.658	4.7519	13.202	0.3245	0.3905	0.02507	1.88	1.967	44.1	1.17	1.86
1496344.	193958.	943853.	1.257	0.668	2.1091	19.077	0.3897	0.4058	0.02176	1.89	1.768	43.7	1.26	1.97
1921388.	195903.	689536.	1.259	0.673	1.0774	24.388	0.4385	0.4154	0.01839	1.89	1.629	43.1	1.35	2.12
2286482.	197926.	509804.	1.140	0.675	0.5879	29.053	0.4472	0.4174	0.01514	1.90	1.495	42.0	1.41	2.29
2419788.	199836.	449234.	1.056	0.675	0.4481	30.596	0.4405	0.4187	0.01371	1.90	1.433	41.5	1.42	2.38
2519438.	199291.	376766.	0.968	0.675	0.3450	32.157	0.4297	0.4204	0.01239	1.91	1.366	40.9	1.41	2.48
2587719.	211612.	377817.	0.878	0.675	0.2757	31.003	0.4159	0.4210	0.01136	1.91	1.332	41.3	1.42	2.52
2645956.	243076.	365868.	0.733	0.675	0.1860	27.246	0.3887	0.4210	0.00972	1.91	1.275	42.6	1.43	2.57
2630116.	233897.	313539.	0.656	0.681	0.1257	23.265	0.3669	0.4144	0.00824	1.92	1.149	41.8	1.36	2.71
2570582.	240869.	297293.	0.613	0.696	0.0921	26.399	0.3508	0.4074	0.00716	1.93	1.077	42.4	1.31	2.76
2491363.	278122.	324155.	0.596	0.692	0.0742	21.685	0.3434	0.4089	0.00646	1.92	1.045	44.8	1.29	2.75
2403223.	295962.	331534.	0.591	0.696	0.0612	19.323	0.3388	0.4070	0.00583	1.92	0.997	46.2	1.25	2.78
HEAT BALANCE, 0.02 TEST VOLTAGE, 29.0 HEAT INPUT/UNIT AREA, 1.160 ID, 0.438 OD, 0.502 LENGTH, 24.0														
733755.	182517.	853104.	1.232	0.628	3.6822	9.011	0.3554	0.3598	0.02651	1.15	2.088	33.1	1.52	1.74
983806.	181509.	651813.	1.233	0.644	1.7028	12.140	0.4149	0.3758	0.02302	1.15	1.934	32.9	1.65	1.77
1223449.	212138.	555735.	1.191	0.648	0.9193	12.678	0.4464	0.3796	0.01981	1.15	1.906	33.9	1.87	1.78
1391333.	200618.	410618.	1.013	0.664	0.5006	15.703	0.4341	0.4003	0.01587	1.16	1.690	32.2	1.74	1.98
1443530.	241849.	436864.	0.923	0.659	0.4090	13.061	0.4221	0.3935	0.01503	1.16	1.760	34.0	1.90	1.92
1476947.	227563.	376058.	0.837	0.667	0.3120	14.622	0.4079	0.4055	0.01332	1.16	1.623	32.9	1.76	2.05
1494407.	211787.	324046.	0.765	0.672	0.2415	16.353	0.3940	0.4159	0.01182	1.16	1.487	31.8	1.63	2.21
1493400.	252229.	347345.	0.668	0.672	0.1717	12.860	0.3706	0.4156	0.01035	1.16	1.486	33.9	1.68	2.19
1461825.	234194.	288839.	0.617	0.674	0.1172	14.253	0.3531	0.4181	0.00855	1.17	1.277	32.6	1.49	2.39
1461251.	232715.	270823.	0.597	0.675	0.0884	13.881	0.3453	0.4201	0.00740	1.17	1.165	32.7	1.39	2.50
1364321.	234410.	294852.	0.591	0.675	0.0739	11.377	0.3405	0.4199	0.00671	1.17	1.147	34.6	1.38	2.49
1310739.	231822.	233805.	0.592	0.673	0.0073	12.777	0.3380	0.4188	0.00586	1.18	0.993	33.3	1.29	2.71
HEAT BALANCE, 0.02 TEST VOLTAGE, 29.9 HEAT INPUT/UNIT AREA, 1.154 ID, 0.438 OD, 0.502 LENGTH, 24.0														
646519.	229173.	927298.	1.154	0.617	5.2552	6.147	0.3201	0.3764	0.02014	1.15	1.987	34.0	1.36	1.83
840636.	191855.	674619.	1.105	0.642	2.2686	9.767	0.3672	0.4024	0.01758	1.15	1.709	32.4	1.32	1.90
1036289.	265050.	679423.	1.024	0.629	1.3816	8.143	0.3959	0.3880	0.01643	1.15	1.827	36.5	1.71	1.82
1197879.	171261.	366453.	0.950	0.662	0.6951	16.214	0.4068	0.4251	0.01269	1.16	1.380	30.8	1.30	2.23
1257830.	264041.	505013.	0.896	0.646	0.6351	10.019	0.4036	0.4067	0.01300	1.15	1.613	35.8	1.67	1.99
1302880.	289163.	502872.	0.848	0.645	0.5250	9.303	0.3990	0.4058	0.01229	1.15	1.623	36.8	1.74	1.98
1334776.	268041.	436270.	0.803	0.654	0.4149	10.558	0.3929	0.4164	0.01107	1.16	1.493	35.6	1.61	2.11
1365570.	273739.	392562.	0.718	0.660	0.2877	10.685	0.3782	0.4250	0.00949	1.16	1.383	35.6	1.53	2.24
1364083.	288162.	376432.	0.660	0.662	0.2162	10.030	0.3677	0.4250	0.00834	1.16	1.309	36.3	1.50	2.30
1343423.	221800.	274980.	0.626	0.667	0.1562	13.666	0.3618	0.4277	0.00689	1.17	1.058	33.0	1.25	2.61
1311951.	310104.	310809.	0.607	0.664	0.0029	8.751	0.3580	0.4256	0.00662	1.16	1.176	37.7	1.54	2.49
1274902.	237953.	237978.	0.598	0.666	0.0001	11.829	0.3558	0.4243	0.00564	1.17	0.950	34.4	1.26	2.78
HEAT BALANCE, 0.02 TEST VOLTAGE, 28.4 HEAT INPUT/UNIT AREA, 1.105 ID, 0.438 OD, 0.502 LENGTH, 24.0														
848617.	198467.	1372749.	1.183	0.656	10.8892	10.749	0.2726	0.4179	0.01111	1.09	1.071	39.7	0.51	1.95
999261.	147744.	1021104.	1.166	0.665	5.2129	17.509	0.3315	0.4254	0.01008	1.10	0.914	36.8	0.47	2.07
1170825.	137484.	817136.	1.152	0.667	3.0529	22.154	0.3311	0.4268	0.00934	1.10	0.841	36.5	0.49	2.20
1369021.	119141.	605993.	1.128	0.669	1.8835	30.147	0.3585	0.4217	0.00857	1.11	0.762	35.1	0.49	2.39
1458188.	139040.	618257.	1.109	0.667	1.6326	27.215	0.3703	0.4258	0.00849	1.10	0.776	37.0	0.53	2.37
1556354.	137521.	598196.	1.067	0.667	1.3546	29.429	0.3802	0.4243	0.00806	1.10	0.754	36.9	0.55	2.43
1652770.	153126.	596361.	1.063	0.667	1.1832	27.704	0.3884	0.4261	0.00784	1.10	0.759	38.2	0.58	2.43
1834167.	217039.	630829.	1.026	0.665	0.9689	20.655	0.4017	0.4254	0.00764	1.10	0.814	42.9	0.69	2.42
1994167.	206647.	522097.	0.988	0.667	0.7046	23.871	0.4090	0.4262	0.00691	1.10	0.762	41.9	0.69	2.42
2124667.	226520.	495050.	0.927	0.667	0.5496	22.969	0.4072	0.4264	0.00641	1.10	0.750	43.0	0.72	2.45
2222583.	277261.	529606.	0.870	0.665	0.4559	19.041	0.4024	0.4253	0.00610	1.09	0.773	45.8	0.78	2.39
2290728.	296385.	510471.	0.817	0.666	0.3676	19.208	0.3957	0.4255	0.00565	1.10	0.757	46.6	0.80	2.42

TABLE IV. - Continued. UNIFORMLY

(b) Concluded. Test section 2; tube inside diameter, 0.438 inch; tube outside

EL	P8	T8	ROB	VELUC	M	X2	TO	TW	H	H/HHK	H/HM <sub>w</sub>	H/HF	TW/TB	THETA	ROFM
RUN 22-1190 WEIGHT FLOW, 0.1328 HEAT INPUT, 16.90 INLET BULK TEMP, 49.7 OUTLET BULK TEMP, 80.3 PLOT CH M															
2.50	633.5	54.1	4.076	31.1	0.009	0.0187	294.	246.	0.00265	1.90	1.42	2.01	4.54	0.135	3.85
4.50	633.1	57.4	3.924	32.3	0.010	0.0289	309.	261.	0.00250	1.80	1.26	1.93	4.55	0.111	3.58
6.50	632.8	60.4	3.769	33.6	0.011	0.0416	347.	296.	0.00216	1.59	1.07	1.74	4.90	0.083	3.26
8.50	632.4	63.2	3.612	35.1	0.012	0.0573	369.	322.	0.00197	1.44	0.94	1.63	5.10	0.065	2.94
9.50	632.2	64.5	3.532	35.8	0.012	0.0663	365.	319.	0.00201	1.43	0.91	1.60	4.94	0.061	2.81
10.50	632.0	65.7	3.453	36.7	0.013	0.0761	400.	354.	0.00177	1.27	0.82	1.45	5.38	0.049	2.60
11.50	631.8	67.0	3.373	37.5	0.014	0.0868	390.	344.	0.00184	1.29	0.81	1.47	5.13	0.047	2.50
13.50	631.5	69.3	3.213	39.4	0.015	0.1104	400.	354.	0.00179	1.21	0.75	1.39	5.11	0.038	2.23
15.50	631.1	71.5	3.054	41.5	0.016	0.1371	422.	376.	0.00168	1.10	0.68	1.29	5.26	0.028	1.96
17.50	630.7	73.5	2.897	43.7	0.018	0.1666	444.	399.	0.00158	1.00	0.63	1.19	5.42	0.020	1.72
19.50	630.3	75.6	2.744	46.1	0.020	0.1988	436.	390.	0.00163	0.98	0.61	1.17	5.16	0.014	1.56
21.50	630.0	77.5	2.595	48.8	0.022	0.2336	440.	394.	0.00162	0.94	0.59	1.12	5.09	0.008	1.41
RUN 23-1245 WEIGHT FLOW, 0.0825 HEAT INPUT, 51.10 INLET BULK TEMP, 90.9 OUTLET BULK TEMP, 253.0 PLOT CH N															
2.50	628.1	105.8	1.319	59.7	0.027	0.6954	1026.	717.	0.00188	1.32	1.51	2.05	8.69	-0.032	0.31
4.50	627.8	119.7	1.086	72.5	0.031	0.7935	1205.	1099.	0.00158	1.05	1.36	1.67	9.18	-0.041	0.23
6.50	627.5	135.0	0.920	85.5	0.035	0.9898	1298.	1192.	0.00147	0.94	1.26	1.45	8.83	-0.052	0.18
8.50	627.1	150.6	0.801	98.2	0.039	0.9999	1276.	1190.	0.00149	0.92	1.20	1.33	7.90	-0.068	0.17
9.50	627.0	158.2	0.755	104.2	0.041	0.9999	1263.	1156.	0.00155	0.93	1.18	1.30	7.31	-0.079	0.18
10.50	626.8	165.8	0.714	110.2	0.042	0.9999	1265.	1159.	0.00156	0.92	1.15	1.26	6.99	-0.087	0.17
11.50	626.7	173.5	0.678	116.1	0.044	0.9999	1197.	1093.	0.00168	0.96	1.15	1.26	6.28	-0.102	0.18
13.50	626.3	188.2	0.619	127.2	0.047	0.9999	1064.	958.	0.00199	1.06	1.18	1.29	5.09	-0.141	0.20
15.50	626.0	202.2	0.572	137.7	0.049	0.9999	1091.	984.	0.00196	1.02	1.11	1.22	4.87	-0.157	0.19
17.50	625.7	216.3	0.532	148.0	0.052	0.9999	1076.	969.	0.00204	1.02	1.07	1.20	4.48	-0.181	0.19
19.50	625.4	229.5	0.499	157.7	0.054	0.9999	1042.	935.	0.00217	1.05	1.06	1.20	4.07	-0.212	0.20
21.50	625.1	242.6	0.471	167.2	0.056	0.9999	1051.	944.	0.00218	1.03	1.02	1.17	3.89	-0.232	0.19
RUN 25-1244 WEIGHT FLOW, 0.1430 HEAT INPUT, 52.10 INLET BULK TEMP, 88.7 OUTLET BULK TEMP, 186.7 PLOT CH P															
2.50	613.1	96.9	1.510	90.3	0.042	0.6051	843.	730.	0.00248	1.14	1.13	1.64	7.54	-0.028	0.42
4.50	612.9	104.3	1.316	103.7	0.047	0.6908	964.	855.	0.00211	0.95	1.05	1.43	8.19	-0.034	0.32
6.50	612.3	112.4	1.163	117.3	0.052	0.7573	1069.	960.	0.00188	0.82	0.97	1.26	8.54	-0.039	0.27
8.50	611.7	121.0	1.041	131.0	0.056	0.8072	1027.	918.	0.00199	0.84	1.00	1.20	7.59	-0.053	0.26
9.50	611.3	125.4	0.989	137.9	0.059	0.8271	1003.	894.	0.00206	0.84	1.01	1.17	7.13	-0.060	0.26
10.50	611.0	129.9	0.942	144.8	0.061	0.8439	992.	883.	0.00210	0.84	1.01	1.14	6.79	-0.068	0.25
11.50	610.7	134.5	0.899	151.7	0.063	0.8555	937.	828.	0.00227	0.88	1.03	1.14	6.16	-0.080	0.23
13.50	610.2	143.9	0.824	165.5	0.067	0.9999	798.	682.	0.00291	1.00	1.15	1.19	4.74	-0.121	0.27
15.50	609.9	152.7	0.766	178.0	0.070	0.9999	819.	705.	0.00284	0.96	1.09	1.14	4.61	-0.134	0.26
17.50	609.4	161.6	0.716	190.5	0.074	0.9999	784.	667.	0.00309	0.99	1.11	1.14	4.12	-0.164	0.27
19.50	608.9	170.5	0.672	202.9	0.077	0.9999	754.	635.	0.00336	1.01	1.12	1.14	3.72	-0.197	0.28
21.50	608.6	179.5	0.634	215.2	0.081	0.9999	751.	632.	0.00344	1.01	1.10	1.12	3.52	-0.222	0.27
RUN 26-1241 WEIGHT FLOW, 0.0754 HEAT INPUT, 26.50 INLET BULK TEMP, 98.0 OUTLET BULK TEMP, 199.3 PLOT CH Q															
2.50	609.0	107.2	1.248	57.6	0.026	0.7190	633.	570.	0.00172	1.11	1.15	1.38	5.31	-0.061	0.43
4.50	608.8	115.0	1.116	64.5	0.028	0.7761	730.	670.	0.00143	0.93	1.03	1.19	5.88	-0.064	0.35
6.50	608.5	123.4	1.007	71.4	0.030	0.8197	768.	709.	0.00137	0.88	0.99	1.11	5.74	-0.076	0.31
8.50	608.2	132.1	0.917	78.4	0.033	0.9772	786.	728.	0.00135	0.84	0.96	1.05	5.51	-0.089	0.26
9.50	608.1	136.6	0.878	82.0	0.034	0.9919	818.	761.	0.00129	0.80	0.93	1.01	5.57	-0.092	0.25
10.50	608.0	141.2	0.841	85.5	0.035	0.9999	815.	758.	0.00131	0.80	0.92	0.99	5.37	-0.101	0.25
11.50	607.8	145.7	0.809	88.9	0.036	0.9999	818.	761.	0.00131	0.79	0.91	0.97	5.23	-0.108	0.25
13.50	607.6	154.3	0.754	95.4	0.038	0.9999	748.	688.	0.00150	0.84	0.95	0.98	4.46	-0.141	0.26
15.50	607.3	162.9	0.707	101.8	0.039	0.9999	783.	724.	0.00143	0.80	0.89	0.93	4.44	-0.150	0.25
17.50	607.0	171.7	0.665	108.1	0.041	0.9999	744.	684.	0.00156	0.82	0.90	0.94	3.99	-0.181	0.26
19.50	606.8	180.4	0.629	114.4	0.043	0.9999	736.	676.	0.00162	0.82	0.89	0.93	3.75	-0.205	0.26
21.50	606.5	188.5	0.598	120.2	0.044	0.9999	721.	660.	0.00170	0.83	0.89	0.93	3.50	-0.232	0.26
RUN 27-1239 WEIGHT FLOW, 0.0843 HEAT INPUT, 26.70 INLET BULK TEMP, 78.6 OUTLET BULK TEMP, 176.0 PLOT CH R															
2.50	320.3	86.2	0.878	91.6	0.050	0.7282	764.	703.	0.00131	0.87	1.02	1.38	8.16	-0.032	0.20
4.50	319.9	93.4	0.761	105.7	0.055	0.7951	818.	760.	0.00122	0.79	1.01	1.24	8.13	-0.041	0.17
6.50	319.6	101.3	0.669	120.1	0.059	0.8455	799.	740.	0.00127	0.79	1.04	1.15	7.30	-0.055	0.16
8.50	319.3	109.7	0.598	134.5	0.063	0.8827	785.	725.	0.00132	0.79	1.06	1.08	6.61	-0.071	0.16
9.50	319.1	113.9	0.568	141.5	0.066	0.8970	753.	693.	0.00140	0.80	1.08	1.06	6.08	-0.082	0.16
10.50	318.9	118.1	0.542	148.4	0.068	0.9094	759.	698.	0.00139	0.79	1.07	1.03	5.91	-0.090	0.16
11.50	318.6	122.4	0.518	155.3	0.070	0.9202	716.	654.	0.00152	0.82	1.10	1.04	5.34	-0.106	0.16
13.50	318.4	131.1	0.476	169.0	0.074	0.9376	640.	575.	0.00181	0.90	1.18	1.07	4.39	-0.146	0.18
15.50	318.1	139.9	0.440	182.7	0.077	0.9507	649.	585.	0.00180	0.87	1.14	1.02	4.18	-0.166	0.17
17.50	317.8	148.4	0.411	195.7	0.081	0.9999	640.	575.	0.00188	0.88	1.13	1.01	3.88	-0.193	0.16
19.50	317.4	156.6	0.386	208.1	0.084	0.9999	622.	556.	0.00200	0.90	1.12	1.01	3.55	-0.226	0.16
21.50	317.1	164.7	0.365	220.4	0.088	0.9999	629.	564.	0.00201	0.88	1.09	0.99	3.42	-0.247	0.16
RUN 28-1240 WEIGHT FLOW, 0.1278 HEAT INPUT, 27.10 INLET BULK TEMP, 105.7 OUTLET BULK TEMP, 153.3 PLOT CH S															
2.50	619.4	111.5	1.192	102.3	0.045	0.7473	433.	359.	0.00329	1.16	1.10	1.28	3.22	-0.130	0.60
4.50	619.1	116.3	1.116	109.2	0.048	0.7789	475.	402.	0.00286	1.00	1.01	1.11	3.46	-0.129	0.52
6.50	618.8	121.3	1.049	116.2	0.050	0.8058	482.	409.	0.00284	0.96	1.00	1.06	3.37	-0.145	0.50
8.50	618.5	126.5	0.990	123.2	0.052	0.8283	489.	416.	0.00282	0.92	0.99	1.02	3.29	-0.163	0.48
9.50	618.4	129.1	0.962	126.7	0.053	0.8381	507.	435.	0.00268	0.88	0.95	0.98	3.37	-0.162	0.45
10.50	618.2	131.7	0.936	130.2	0.054	0.9772	500.	428.	0.00276	0.89	0.96	0.98	3.25	-0.176	0.41
11.50	618.1	134.4	0.911	133.8	0.055	0.9862	505.	433.	0.00275	0.87	0.95	0.96	3.22	-0.184	0.40
13.50	617.8	139.8	0.866	140.8	0.057	0.9999	463.	370.	0.00326	0.97	1.05	1.05	2.79	-0.242	0.43
15.50	617.5	145.2	0.825	147.8	0.059	0.9999	503.	431.	0.00287	0.87	0.96	0.94	2.97	-0.231	0.39
17.50	617.2	150.3	0.790	154.3	0.061	0.9999	489.	417.	0.00307	0.89	0.98	0.95	2.77	-0.267	0.40
19.50	616.9	155.5	0.758	160.8	0.063	0.9999	499.	427.	0.00301	0.87	0.95	0.93	2.75	-0.281	0.39
21.50	616.6	160.7	0.729	167.2	0.065	0.9999	495.	422.	0.00313	0.88	0.90	0.94	2.63	-0.311	0.38

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.502 inch; heated tube length, 24 inches; material, Inconel

RE-J	RE-F	RE-F,MN	PR-H	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q/DL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.02 TEST VOLTAGE, 19.2 HEAT INPUT/UNIT AREA, 0.511 ID, 0.438 OD, 0.502 LENGTH, 24.0														
643444.	343716.	1625006.	1.197	0.596	17.3382	4.183	0.2640	0.3507	0.00799	0.51	0.826	43.7	0.47	1.86
712195.	322095.	1523566.	1.185	0.602	11.2308	4.913	0.2813	0.3550	0.00788	0.51	0.781	43.7	0.47	1.84
786650.	276348.	1355445.	1.182	0.616	7.4894	6.410	0.2996	0.3655	0.00769	0.51	0.722	42.1	0.45	1.82
867901.	252487.	1218013.	1.181	0.628	5.3065	7.795	0.3186	0.3758	0.00741	0.51	0.681	41.3	0.44	1.82
911064.	260632.	1197508.	1.181	0.627	4.6434	7.861	0.3282	0.3749	0.00732	0.51	0.679	41.9	0.46	1.81
955849.	228629.	1071693.	1.180	0.641	3.8563	9.571	0.3377	0.3887	0.00707	0.51	0.640	40.2	0.43	1.85
1002076.	242785.	1068334.	1.178	0.638	3.4489	9.356	0.3470	0.3852	0.00701	0.51	0.645	41.1	0.45	1.83
1098177.	242313.	985180.	1.171	0.642	2.6806	10.252	0.3648	0.3900	0.00674	0.51	0.628	41.2	0.47	1.85
1197563.	232339.	880595.	1.156	0.648	2.0896	11.737	0.3805	0.3970	0.00641	0.51	0.602	40.7	0.47	1.89
1297753.	223616.	785242.	1.135	0.654	1.6558	13.326	0.3936	0.4032	0.00606	0.51	0.577	40.0	0.46	1.94
1396112.	241305.	762477.	1.113	0.653	1.3830	13.105	0.4044	0.4016	0.00585	0.51	0.579	41.0	0.49	1.93
1490363.	249603.	719117.	1.100	0.654	1.1479	13.468	0.4140	0.4031	0.00559	0.51	0.571	41.3	0.51	1.95
HEAT BALANCE, 0.04 TEST VOLTAGE, 33.9 HEAT INPUT/UNIT AREA, 1.551 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1217793.	83497.	115049.	0.668	0.686	0.1391	37.587	0.3692	0.4068	0.01169	1.53	1.353	21.6	1.62	3.02
1182056.	76232.	93480.	0.611	0.678	0.0879	40.483	0.3556	0.4110	0.00968	1.54	1.156	21.0	1.44	3.38
1126555.	78082.	78781.	0.594	0.674	0.0053	37.495	0.3494	0.4143	0.00829	1.55	1.034	21.4	1.44	3.63
1068398.	88134.	80143.	0.596	0.673	0.0001	30.891	0.3505	0.4148	0.00733	1.55	0.968	22.7	1.33	3.65
1041235.	96591.	76600.	0.601	0.674	0.0001	27.046	0.3541	0.4140	0.00696	1.55	0.954	23.6	1.30	3.61
1014937.	100802.	100811.	0.607	0.674	0.0001	25.033	0.3580	0.4143	0.00663	1.55	0.927	24.1	1.26	3.62
989685.	114769.	114779.	0.613	0.676	0.0001	20.926	0.3623	0.4124	0.00635	1.54	0.933	25.4	1.26	3.51
944786.	147729.	147741.	0.625	0.681	0.0001	14.689	0.3720	0.4087	0.00591	1.53	0.965	28.2	1.29	3.30
905468.	150926.	150940.	0.636	0.679	0.0001	13.618	0.3825	0.4100	0.00551	1.53	0.917	28.9	1.22	3.37
869724.	162408.	162424.	0.645	0.679	0.0001	11.864	0.3931	0.4099	0.00519	1.53	0.903	30.1	1.20	3.37
838760.	178152.	178171.	0.652	0.680	0.0001	10.116	0.3996	0.4092	0.00474	1.53	0.907	31.6	1.20	3.33
810456.	182920.	182940.	0.657	0.679	0.0001	9.380	0.4062	0.4100	0.00471	1.53	0.886	32.3	1.17	3.37
HEAT BALANCE, 0.04 TEST VOLTAGE, 34.0 HEAT INPUT/UNIT AREA, 1.583 ID, 0.438 OD, 0.502 LENGTH, 24.0														
2127772.	177141.	273949.	0.749	0.683	0.2101	30.257	0.3878	0.4142	0.00839	1.57	1.054	36.0	1.19	2.71
2131100.	158046.	218839.	0.673	0.690	0.1441	34.370	0.3707	0.4070	0.00721	1.58	0.946	34.6	1.13	2.91
2101228.	148613.	189923.	0.629	0.684	0.1061	36.393	0.3595	0.4064	0.00636	1.59	0.855	33.9	1.06	3.10
2052966.	174657.	210131.	0.606	0.688	0.0889	29.585	0.3534	0.4066	0.00579	1.59	0.838	35.9	1.05	3.05
2024887.	189706.	222042.	0.600	0.687	0.0829	26.520	0.3511	0.4067	0.00555	1.58	0.832	37.1	1.05	3.02
1995134.	201286.	232006.	0.595	0.687	0.0778	24.377	0.3493	0.4067	0.00532	1.58	0.821	38.0	1.04	3.01
1964391.	229125.	231896.	0.593	0.690	0.0086	20.604	0.3480	0.4070	0.00514	1.58	0.834	39.9	1.13	2.97
1902049.	324011.	324040.	0.592	0.683	0.0001	13.230	0.3462	0.4144	0.00470	1.56	0.894	45.5	1.19	2.78
1845111.	325551.	325579.	0.598	0.693	0.0001	12.611	0.3499	0.4093	0.00454	1.57	0.860	46.1	1.14	2.80
1790071.	370548.	370577.	0.605	0.684	0.0002	10.430	0.3543	0.4139	0.00433	1.56	0.866	48.7	1.14	2.78
1737428.	414798.	414830.	0.612	0.675	0.0002	8.767	0.3592	0.4179	0.00413	1.56	0.873	51.3	1.14	2.77
1687362.	433480.	433513.	0.619	0.678	0.0002	7.977	0.3644	0.4168	0.00390	1.56	0.863	52.7	1.12	2.77
HEAT BALANCE, -0.01 TEST VOLTAGE, 24.3 HEAT INPUT/UNIT AREA, 0.806 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1121536.	157254.	206679.	0.652	0.671	0.1577	16.642	0.3650	0.4227	0.00736	0.80	0.981	25.7	1.13	2.50
1102202.	135912.	168082.	0.619	0.670	0.1165	19.465	0.3570	0.4203	0.00637	0.80	0.854	24.5	1.02	2.71
1075534.	137500.	161998.	0.602	0.685	0.0952	18.549	0.3518	0.4132	0.00572	0.80	0.809	24.7	0.99	2.74
1045067.	142334.	145024.	0.594	0.694	0.0135	17.151	0.3484	0.4089	0.00521	0.80	0.774	25.3	1.04	2.80
1027119.	138384.	139288.	0.592	0.693	0.0053	17.421	0.3472	0.4074	0.00496	0.81	0.745	25.1	1.00	2.86
1013004.	143967.	143980.	0.592	0.693	0.0001	16.326	0.3464	0.4073	0.00477	0.81	0.734	25.6	0.99	2.87
997375.	147522.	147535.	0.593	0.693	0.0001	15.580	0.3467	0.4072	0.00460	0.81	0.720	25.9	0.97	2.88
968162.	179257.	179272.	0.599	0.689	0.0092	11.927	0.3505	0.4116	0.00440	0.80	0.742	28.1	0.98	2.79
939941.	174957.	174971.	0.606	0.694	0.0002	11.814	0.3548	0.4076	0.00410	0.80	0.707	28.1	0.93	2.85
912941.	197347.	197362.	0.613	0.693	0.0002	9.833	0.3597	0.4095	0.00391	0.80	0.716	29.7	0.94	2.80
887392.	208623.	208639.	0.620	0.693	0.0002	8.851	0.3649	0.4094	0.00372	0.80	0.710	30.6	0.93	2.80
865014.	222529.	222545.	0.627	0.691	0.0002	7.905	0.3708	0.4106	0.00358	0.80	0.712	31.7	0.93	2.80
HEAT BALANCE, -0.01 TEST VOLTAGE, 24.4 HEAT INPUT/UNIT AREA, 0.808 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1583354.	104895.	141271.	0.662	0.679	0.0912	39.856	0.3622	0.4136	0.00823	0.81	0.936	22.7	1.10	2.65
1538595.	104277.	129345.	0.617	0.695	0.0647	38.211	0.3394	0.4063	0.00709	0.81	0.867	22.7	1.05	2.74
1481420.	121582.	142190.	0.598	0.692	0.0501	31.019	0.3228	0.4076	0.00635	0.81	0.836	24.0	1.02	2.73
1420237.	148078.	154954.	0.592	0.690	0.0401	25.693	0.3119	0.4083	0.00575	0.81	0.806	25.2	0.99	2.72
1390724.	155033.	171327.	0.593	0.683	0.0371	22.173	0.3099	0.4116	0.00555	0.81	0.806	26.3	0.99	2.68
1361574.	158884.	173231.	0.596	0.685	0.0336	20.983	0.3085	0.4105	0.00530	0.81	0.788	26.7	0.97	2.70
1333050.	182181.	196311.	0.599	0.679	0.0318	17.601	0.3076	0.4140	0.00516	0.81	0.802	28.0	0.98	2.64
1278513.	232131.	245441.	0.606	0.682	0.0289	12.529	0.3072	0.4151	0.00490	0.80	0.847	30.9	1.02	2.51
1227519.	239875.	250258.	0.614	0.681	0.0253	11.465	0.3080	0.4158	0.00452	0.80	0.811	31.7	0.99	2.55
1182211.	257570.	257595.	0.623	0.681	0.0001	10.027	0.3119	0.4158	0.00425	0.80	0.802	32.9	1.01	2.56
1142015.	280325.	280353.	0.632	0.682	0.0001	8.632	0.3180	0.4155	0.00405	0.80	0.807	34.4	1.01	2.54
1104753.	286171.	286194.	0.640	0.681	0.0002	8.064	0.3245	0.4156	0.00382	0.80	0.785	35.0	0.99	2.57
HEAT BALANCE, 0.23 TEST VOLTAGE, 24.2 HEAT INPUT/UNIT AREA, 0.818 ID, 0.438 OD, 0.502 LENGTH, 24.0														
1875883.	517484.	641428.	0.634	0.654	0.1772	7.044	0.3609	0.4022	0.00501	0.81	0.929	50.4	1.10	2.00
1854151.	469801.	560363.	0.618	0.663	0.1486	7.898	0.3570	0.4145	0.00451	0.82	0.834	48.6	0.98	2.15
1828202.	480886.	563331.	0.607	0.665	0.1320	7.565	0.3538	0.4175	0.00422	0.82	0.812	49.2	0.96	2.19
1799393.	491664.	562626.	0.599	0.666	0.1192	7.235	0.3513	0.4200	0.00396	0.82	0.792	49.9	0.94	2.23
1784238.	474037.	537746.	0.597	0.667	0.1122	7.570	0.3503	0.4202	0.00380	0.82	0.756	49.3	0.90	2.28
1768727.	492944.	501123.	0.595	0.667	0.1073	7.104	0.3494	0.4201	0.00372	0.8				

TABLE IV. - Continued. UNIFORMLY

(c) Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HM	H/HF	TW/TB	THETA	RDFM
RUN 1- 880 WEIGHT FLOW, 0.1220 HEAT INPUT, 54.00 INLET BULK TEMP, 50.9 OUTLET BULK TEMP, 165.2 PLOT CH 2															
2.50	269.1	59.1	3.216	62.0	0.027	0.0542	520.	432.	0.00470	3.54	1.41	5.35	7.30	0.013	1.95
4.50	268.5	62.7	2.570	77.6	0.044	0.1220	586.	495.	0.00423	2.46	0.90	4.28	7.92	0.003	1.08
6.50	267.4	64.6	1.888	105.6	0.070	0.2511	788.	697.	0.00328	1.42	0.76	3.28	10.78	-0.001	0.47
8.50	265.4	67.5	1.345	148.2	0.099	0.4301	811.	729.	0.00323	1.18	0.94	2.54	10.67	-0.006	0.28
9.50	264.0	70.0	1.135	175.6	0.113	0.5267	1060.	960.	0.00270	0.89	1.03	2.35	13.71	-0.007	0.18
10.50	262.6	73.6	0.962	207.2	0.128	0.6197	1047.	948.	0.00273	0.87	1.12	2.08	12.88	-0.011	0.15
11.50	261.0	77.9	0.830	240.2	0.142	0.6979	1003.	906.	0.00282	0.88	1.19	1.86	11.62	-0.017	0.14
13.50	258.0	88.3	0.648	307.8	0.167	0.8095	932.	839.	0.00300	0.90	1.29	1.56	9.49	-0.033	3.13
15.50	255.0	100.3	0.529	376.9	0.188	0.8782	928.	835.	0.00306	0.88	1.32	1.38	8.32	-0.050	0.11
17.50	251.8	112.9	0.447	446.3	0.209	0.9202	999.	807.	0.00319	0.88	1.31	1.25	7.14	-0.072	0.11
19.50	248.3	125.5	0.387	514.7	0.230	0.9462	867.	775.	0.00335	0.88	1.27	1.16	6.17	-0.096	0.11
21.50	244.7	138.3	0.341	584.4	0.250	0.9633	882.	790.	0.00336	0.85	1.21	1.10	5.71	-0.116	0.10
RUN 3- 877 WEIGHT FLOW, 0.1670 HEAT INPUT, 56.00 INLET BULK TEMP, 49.7 OUTLET BULK TEMP, 124.0 PLOT CH 4															
2.50	274.1	57.0	3.465	78.7	0.031	0.0378	509.	414.	0.00525	3.35	1.39	4.78	7.26	0.020	2.37
4.50	273.3	60.9	2.987	91.3	0.044	0.0749	563.	467.	0.00479	2.52	1.01	4.06	7.67	0.008	1.57
6.50	271.8	63.2	2.438	111.9	0.067	0.1430	725.	628.	0.00381	1.58	0.67	3.42	9.93	0.001	0.82
8.50	269.5	64.8	1.891	144.3	0.095	0.2518	750.	653.	0.00371	1.26	0.65	2.73	10.08	-0.001	0.50
9.50	268.0	65.7	1.641	166.2	0.112	0.3224	993.	889.	0.00303	0.91	0.66	2.57	13.53	-0.002	0.30
10.50	266.3	67.0	1.413	193.0	0.129	0.4027	1004.	900.	0.00301	0.84	0.74	2.30	13.44	-0.004	0.24
11.50	264.6	68.7	1.226	222.5	0.146	0.4823	964.	862.	0.00310	0.84	0.82	2.06	12.54	-0.006	0.21
13.50	260.9	73.6	0.954	266.0	0.177	0.6224	859.	760.	0.00339	0.86	0.96	1.69	10.33	-0.015	0.18
15.50	256.7	79.9	0.770	354.2	0.206	0.7305	836.	737.	0.00349	0.83	1.05	1.46	9.22	-0.025	0.16
17.50	252.1	87.5	0.640	426.4	0.232	0.8088	798.	709.	0.00367	0.83	1.12	1.29	8.00	-0.040	0.15
19.50	247.4	96.1	0.543	502.2	0.257	0.8641	839.	741.	0.00357	0.79	1.13	1.19	7.71	-0.051	0.13
21.50	242.0	105.2	0.469	582.3	0.283	0.9028	755.	658.	0.00397	0.81	1.17	1.09	6.25	-0.077	0.13
RUN 4- 888 WEIGHT FLOW, 0.0820 HEAT INPUT, 51.00 INLET BULK TEMP, 54.2 OUTLET BULK TEMP, 221.5 PLOT CH 5															
2.50	251.8	61.8	2.613	51.3	0.029	0.1097	581.	502.	0.00364	3.01	1.07	5.44	8.13	0.003	1.11
4.50	251.2	64.0	1.740	77.0	0.053	0.2776	712.	633.	0.00306	1.79	0.88	3.85	9.90	-0.002	0.44
6.50	250.4	68.7	1.108	120.9	0.080	0.5241	982.	898.	0.00245	1.12	1.23	2.85	13.06	-0.007	0.18
8.50	248.8	78.1	0.775	172.8	0.102	0.7185	612.	533.	0.00359	1.49	1.60	2.18	6.83	-0.033	0.21
9.50	247.8	84.7	0.663	202.2	0.113	0.7902	1192.	1093.	0.00222	0.88	1.53	2.01	12.98	-0.021	0.10
10.50	246.7	93.2	0.566	236.8	0.124	0.8500	1173.	1080.	0.00226	0.89	1.56	1.80	11.59	-0.031	0.09
11.50	245.6	102.4	0.494	271.5	0.134	0.8915	1144.	1053.	0.00232	0.91	1.57	1.64	10.28	-0.042	0.09
13.50	243.6	121.0	0.397	337.8	0.153	0.9399	1086.	998.	0.00244	0.93	1.50	1.43	8.25	-0.066	0.09
15.50	241.6	139.8	0.333	402.7	0.172	0.9654	1092.	1003.	0.00249	0.91	1.39	1.29	7.17	-0.089	0.08
17.50	239.6	157.6	0.289	463.6	0.189	0.9999	1083.	995.	0.00255	0.90	1.26	1.20	6.31	-0.113	0.08
19.50	237.5	175.0	0.256	523.6	0.205	0.9999	1101.	1011.	0.00258	0.88	1.17	1.13	5.78	-0.135	0.07
21.50	235.3	191.3	0.231	580.4	0.220	0.9999	1075.	987.	0.00268	0.88	1.08	1.08	5.16	-0.162	0.07
RUN 14- 702 WEIGHT FLOW, 0.0970 HEAT INPUT, 33.60 INLET BULK TEMP, 50.0 OUTLET BULK TEMP, 145.0 PLOT CH E															
2.50	255.0	57.0	3.419	46.4	0.019	0.0381	388.	328.	0.00396	4.18	1.36	5.48	5.75	0.023	2.50
4.50	254.7	60.6	2.933	54.0	0.027	0.0753	447.	388.	0.00344	2.98	0.97	4.40	6.41	0.008	1.66
6.50	254.0	62.5	2.381	66.5	0.041	0.1436	525.	465.	0.00297	2.00	0.62	3.45	7.44	0.002	0.97
8.50	253.2	63.9	1.834	86.4	0.059	0.2539	652.	591.	0.00249	1.33	0.60	2.71	9.25	-0.001	0.51
9.50	252.7	64.7	1.588	99.8	0.069	0.3253	733.	672.	0.00228	1.09	0.64	2.42	10.38	-0.002	0.36
10.50	252.1	65.9	1.371	115.6	0.079	0.4045	792.	730.	0.00216	0.96	0.73	2.17	11.08	-0.004	0.28
11.50	251.4	67.7	1.188	133.4	0.089	0.4854	820.	757.	0.00212	0.89	0.81	1.98	11.19	-0.007	0.23
13.50	250.0	73.0	0.915	173.2	0.108	0.6225	820.	756.	0.00214	0.83	0.95	1.64	10.37	-0.014	0.17
15.50	248.4	80.1	0.734	215.8	0.125	0.7444	771.	709.	0.00225	0.82	1.04	1.39	8.85	-0.027	0.15
17.50	246.6	88.7	0.611	259.4	0.140	0.8220	758.	697.	0.00231	0.80	1.03	1.23	7.86	-0.042	0.14
19.50	244.8	98.1	0.522	303.8	0.154	0.8748	740.	678.	0.00239	0.79	1.12	1.12	6.61	-0.061	0.13
21.50	242.9	108.1	0.454	349.0	0.167	0.9111	753.	691.	0.00240	0.76	1.12	1.04	6.39	-0.078	0.12
RUN 15- 640 WEIGHT FLOW, 0.1387 HEAT INPUT, 33.12 INLET BULK TEMP, 47.6 OUTLET BULK TEMP, 84.3 PLOT CH F															
2.50	256.5	53.7	3.703	61.2	0.022	0.0236	367.	299.	0.00470	4.06	1.40	5.04	5.56	0.039	3.03
4.50	256.1	57.5	3.369	67.3	0.028	0.0413	403.	337.	0.00423	3.27	1.09	4.35	5.86	0.021	2.40
6.50	255.6	60.2	2.996	75.6	0.037	0.0697	455.	392.	0.00371	2.46	0.82	3.63	6.50	0.009	1.73
8.50	255.0	62.0	2.581	87.8	0.051	0.1150	534.	469.	0.00318	1.72	0.58	2.96	7.56	0.003	1.13
9.50	254.6	62.6	2.360	96.0	0.060	0.1473	584.	519.	0.00294	1.45	0.49	2.69	8.29	0.002	0.88
10.50	254.2	63.1	2.140	105.9	0.069	0.1861	646.	581.	0.00269	1.20	0.48	2.46	9.21	0.000	0.67
11.50	253.8	63.6	1.929	117.4	0.079	0.2308	683.	618.	0.00257	1.05	0.47	2.25	9.72	-0.001	0.53
13.50	252.7	64.8	1.558	145.4	0.100	0.3353	691.	626.	0.00255	0.92	0.53	1.91	9.65	-0.003	0.38
15.50	251.2	66.7	1.272	178.2	0.120	0.4457	619.	554.	0.00281	0.94	0.65	1.67	8.31	-0.007	0.32
17.50	249.4	69.5	1.058	214.1	0.139	0.5493	602.	537.	0.00290	0.90	0.74	1.47	7.74	-0.014	0.27
19.50	247.4	73.1	0.897	252.5	0.157	0.6399	552.	487.	0.00317	0.91	0.84	1.34	6.67	-0.024	0.25
21.50	245.1	77.4	0.773	293.0	0.174	0.7153	560.	495.	0.00315	0.86	0.89	1.21	6.40	-0.035	0.22
RUN 16- 700 WEIGHT FLOW, 0.1676 HEAT INPUT, 35.10 INLET BULK TEMP, 46.7 OUTLET BULK TEMP, 89.5 PLOT CH G															
2.50	281.9	52.3	3.835	71.4	0.024	0.0199	369.	321.	0.00443	3.19	1.28	3.73	6.13	0.045	3.21
4.50	281.2	56.1	3.562	76.9	0.029	0.0330	432.	367.	0.00397	2.61	1.04	3.46	6.54	0.027	2.64
6.50	280.3	59.1	3.259	84.0	0.036	0.0530	497.	432.	0.00348	2.02	0.83	3.00	7.31	0.014	2.01
8.50	279.3	61.5	2.917	93.9	0.046	0.0835	583.	516.	0.00304	1.53	0.65	2.62	8.39	0.006	1.41
9.50	278.6	62.4	2.732	100.2	0.053	0.1044	640.	572.	0.00282	1.31	0.57	2.47	9.16	0.004	1.13
10.50	277.9	63.2	2.535	108.0	0.062	0.1308	706.	638.	0.00261	1.11	0.50	2.32	10.10	0.002	0.89
11.50	277.2	63.8	2.332	117.4	0.072	0.1634	739.	670.	0.00253	0.99	0.45	2.18	10.51	0.001	0.72
13.50	275.7	64.9	1.954	140.2	0.091	0.2408	735.	667.	0.00254	0.87	0.46	1.91	10.27	-0.001	0.52
15.50	274.0	66.2	1.636	167.4	0.112	0.3295	665.	597.	0.00275	0.87	0.49	1.66	9.02	-0.004	0.43
17.50	272.3	67.8	1.383	198.0	0.131	0.4215	634.	567.	0.00287	0.84	0.56	1.49	8.16	-0.008	0.36
19.50	270.2	70.0	1.183	231.5	0.149	0.5098	591.	524.	0.00306	0.84	0.63	1.34	7.48	-0.013	0.32
21.50	267.7	72.8	1.023	267.7	0.167	0.5910	591.	524.	0.00308	0.79	0.69	1.22	7.20	-0.020	0.27



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VIS-RAT	PHI-B	PHI-F	FFLUX	DL/DL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.07 TEST VOLTAGE, 45.9 HEAT INPUT/UNIT AREA, 2.388 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1374236.	102195.	976645.	1.562	0.684	3.1986	35.204	0.4065	0.3873	0.03012	1.75	1.429	52.3	0.91	1.86
1973534.	102444.	623348.	2.665	0.607	1.3476	51.074	0.5951	0.4044	0.02530	1.83	1.366	50.3	1.06	2.05
2652461.	82413.	296462.	2.692	0.681	0.5126	89.362	0.6536	0.4134	0.02004	2.08	1.293	43.1	1.22	2.53
3114042.	108597.	241156.	1.377	0.630	0.2434	79.495	0.5167	0.4126	0.01479	2.11	1.275	43.3	1.36	2.62
3235271.	79838.	147998.	1.004	0.688	0.1480	113.288	0.4529	0.4036	0.01330	2.40	1.253	38.2	1.45	3.02
3282667.	95040.	150678.	0.803	0.689	0.1064	95.929	0.4050	0.4036	0.01197	2.39	1.216	39.4	1.45	3.01
3266346.	116549.	164752.	0.699	0.691	0.0804	76.818	0.3706	0.4036	0.01036	2.34	1.174	41.5	1.42	2.95
3123056.	162992.	199563.	0.617	0.694	0.0499	50.981	0.3275	0.4036	0.00816	2.25	1.090	45.9	1.34	2.86
2922440.	194589.	220223.	0.599	0.694	0.0329	39.085	0.3036	0.4036	0.00684	2.25	1.006	49.0	1.25	2.88
2722745.	233863.	252918.	0.603	0.694	0.0237	29.426	0.2930	0.4036	0.00587	2.21	0.940	52.9	1.18	2.85
2546941.	275661.	290132.	0.616	0.696	0.0183	22.619	0.2926	0.4035	0.00516	2.17	0.890	56.9	1.12	2.82
2390238.	293075.	303123.	0.628	0.694	0.0145	19.603	0.2951	0.4035	0.00467	2.19	0.839	59.2	1.07	2.87
HEAT BALANCE, -0.06 TEST VOLTAGE, 46.2 HEAT INPUT/UNIT AREA, 2.510 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1611023.	141904.	1554403.	1.388	0.682	4.6158	29.333	0.3559	0.3810	0.02473	1.87	1.234	67.5	0.71	1.83
2152811.	135199.	1106538.	1.776	0.686	2.2737	41.993	0.4587	0.3995	0.02221	1.94	1.170	65.6	0.80	1.95
2879565.	104482.	590324.	2.996	0.683	1.0192	75.639	0.6382	0.4130	0.01921	2.15	1.100	57.7	0.88	2.34
3622009.	125327.	446689.	2.638	0.683	0.5305	79.484	0.6481	0.4147	0.01553	2.19	1.093	57.2	1.02	2.45
3936322.	87077.	254500.	2.147	0.692	0.3301	126.152	0.6087	0.4037	0.01473	2.50	1.083	49.4	1.12	2.85
4192649.	98414.	234307.	1.532	0.692	0.2396	118.838	0.5382	0.4037	0.01298	2.51	1.076	49.6	1.17	2.89
4365350.	120113.	241138.	1.147	0.694	0.1833	100.526	0.4799	0.4037	0.01133	2.46	1.063	51.3	1.20	2.84
4504769.	184674.	290474.	0.799	0.690	0.1178	66.370	0.4038	0.4076	0.00898	2.33	1.027	56.5	1.19	2.70
4460445.	234045.	319277.	0.669	0.686	0.0774	51.250	0.3570	0.4094	0.00739	2.30	0.979	59.9	1.15	2.68
4314228.	296848.	363347.	0.618	0.680	0.0543	38.486	0.3269	0.4123	0.00630	2.25	0.931	64.3	1.10	2.64
4118370.	305478.	351025.	0.602	0.671	0.0376	34.905	0.3071	0.4071	0.00595	2.30	0.879	65.5	1.07	2.72
3913203.	411072.	452602.	0.600	0.681	0.0296	23.981	0.2937	0.4129	0.00486	2.19	0.847	72.7	1.02	2.60
HEAT BALANCE, -0.05 TEST VOLTAGE, 45.9 HEAT INPUT/UNIT AREA, 2.231 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1303185.	62644.	419409.	2.812	0.687	1.4448	55.519	0.6031	0.4041	0.03528	1.60	1.643	36.1	1.25	2.06
1894438.	65617.	215725.	2.920	0.684	0.4616	79.352	0.6849	0.4129	0.02523	1.74	1.587	32.7	1.53	2.42
2219410.	58036.	108004.	1.028	0.692	0.1503	106.408	0.4578	0.4035	0.01815	2.03	1.525	28.5	1.75	2.91
2225013.	182032.	248611.	0.681	0.656	0.0943	31.477	0.3611	0.4072	0.01231	1.63	1.516	39.4	1.70	2.26
2158855.	68562.	86147.	0.628	0.682	0.0468	67.697	0.3331	0.4072	0.01233	2.25	1.340	28.6	1.68	3.32
2057645.	81073.	94867.	0.605	0.682	0.0339	69.683	0.3117	0.4068	0.01064	2.23	1.255	30.2	1.59	3.30
1949873.	94965.	100061.	0.600	0.683	0.0258	55.431	0.2979	0.4062	0.00933	2.20	1.179	32.1	1.51	3.27
1756510.	123694.	131168.	0.613	0.654	0.0171	36.967	0.2910	0.4048	0.00754	2.14	1.059	35.8	1.37	3.20
1596716.	141176.	145823.	0.630	0.683	0.0124	28.671	0.2950	0.4057	0.00649	2.15	0.969	38.4	1.26	3.24
1472913.	158974.	158991.	0.647	0.683	0.0001	22.849	0.3084	0.4060	0.00574	2.14	0.904	41.0	1.20	3.27
1371444.	169577.	169573.	0.660	0.682	0.0001	19.538	0.3242	0.4072	0.00522	2.16	0.853	42.8	1.13	3.33
1290658.	189374.	188390.	0.670	0.682	0.0002	16.073	0.3404	0.4069	0.00477	2.13	0.818	45.3	1.08	3.32
HEAT BALANCE, -0.19 TEST VOLTAGE, 33.0 HEAT INPUT/UNIT AREA, 1.436 ID, 0.335 OD, 0.375 LENGTH, 24.0														
965439.	110361.	1107928.	1.434	0.668	4.9843	21.377	0.3665	0.3431	0.02714	1.07	1.225	49.1	0.77	1.69
1294436.	98470.	773519.	1.937	0.681	2.3979	32.760	0.4820	0.3724	0.02458	1.13	1.163	46.5	0.84	1.77
1728277.	91864.	496221.	3.715	0.687	1.1441	49.442	0.7022	0.3985	0.02092	1.20	1.120	43.2	0.92	1.99
2166942.	82537.	271375.	3.080	0.685	0.5358	71.443	0.6740	0.4102	0.01704	1.31	1.082	38.7	1.02	2.32
2349082.	78052.	223593.	2.320	0.682	0.3666	83.252	0.6314	0.4139	0.01528	1.38	1.065	36.5	1.06	2.51
2492458.	78986.	186261.	1.589	0.681	0.2582	87.918	0.5477	0.4117	0.01367	1.44	1.053	35.4	1.12	2.62
2590578.	84788.	158905.	1.160	0.688	0.1889	84.381	0.4828	0.4084	0.01214	1.46	1.045	35.2	1.16	2.68
2660884.	108337.	167969.	0.788	0.689	0.1111	67.007	0.3993	0.4079	0.00963	1.46	1.005	36.6	1.16	2.70
2610838.	147643.	197599.	0.659	0.650	0.0729	47.687	0.3507	0.4122	0.00783	1.42	0.950	39.6	1.11	2.64
2500192.	177789.	214303.	0.614	0.680	0.0500	37.133	0.3214	0.4123	0.00664	1.41	0.896	42.0	1.06	2.64
2367755.	210774.	239245.	0.601	0.680	0.0364	28.922	0.3331	0.4125	0.00575	1.39	0.848	44.8	1.01	2.62
2233512.	228075.	248948.	0.601	0.682	0.0270	24.716	0.2914	0.4112	0.00511	1.40	0.799	46.6	0.97	2.66
HEAT BALANCE, 0.00 TEST VOLTAGE, 33.3 HEAT INPUT/UNIT AREA, 1.392 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1149472.	170291.	1883683.	1.296	0.658	8.1692	16.436	0.3161	0.3274	0.02162	1.15	1.049	66.4	0.59	1.71
1424094.	153755.	1514325.	1.465	0.671	4.5647	22.714	0.3763	0.3482	0.02055	1.18	0.999	64.7	0.64	1.70
1784160.	136636.	1123564.	1.840	0.681	2.5785	32.637	0.4640	0.3736	0.01896	1.23	0.950	61.4	0.67	1.78
2238524.	120120.	762581.	2.886	0.687	1.4344	49.121	0.6132	0.3998	0.01685	1.30	0.905	57.0	0.70	1.99
2495885.	112683.	609584.	3.716	0.687	1.0550	59.257	0.7046	0.4053	0.01569	1.34	0.887	54.4	0.73	2.11
2752207.	104403.	477675.	3.408	0.685	0.7735	71.687	0.7008	0.4095	0.01452	1.39	0.869	51.6	0.76	2.27
2991690.	104968.	403974.	3.190	0.684	0.5967	78.117	0.6977	0.4120	0.01333	1.42	0.861	50.3	0.79	2.37
3388270.	126731.	353768.	2.206	0.684	0.3654	73.194	0.6200	0.4125	0.01109	1.43	0.859	50.4	0.86	2.42
3646820.	154600.	393395.	1.338	0.686	0.2557	52.836	0.5124	0.4079	0.00928	1.37	0.876	54.4	0.92	2.27
3781078.	229031.	402280.	0.978	0.686	0.1790	43.601	0.4429	0.4069	0.00794	1.35	0.870	56.3	0.94	2.24
3819638.	306563.	460024.	0.777	0.687	0.1344	31.988	0.3958	0.4037	0.00693	1.31	0.877	60.7	0.96	2.14
3789243.	339884.	469471.	0.685	0.687	0.0983	28.368	0.3621	0.4044	0.00611	1.32	0.848	61.9	0.95	2.17
HEAT BALANCE, -0.22 TEST VOLTAGE, 53.0 HEAT INPUT/UNIT AREA, 1.502 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1271467.	196706.	2229615.	1.247	0.662	9.6391	16.023	0.2954	0.3400	0.01716	1.19	0.915	73.6	0.47	1.76
1518772.	170635.	1813481.	1.338	0.675	5.6474	22.263	0.3383	0.3640	0.01664	1.23	0.866	71.3	0.49	1.77
1837494.	144038.	1365735.	1.508	0.683	3.3332	33.359	0.3955	0.3880	0.01579	1.30	0.819	67.4	0.51	1.86
2246289.	121722.	959419.	1.831	0.686	1.9639	49.352	0.4733	0.4069	0.01472	1.38	0.783	62.9	0.54	2.06
2487018.	110707.	770195.	2.110	0.685	1.4922	60.893	0.5241	0.4096	0.01413	1.44	0.768	60.2	0.56	2.18
2752101.	100493.	607259.	2.610	0.683	1.1208	75.294	0.5939	0.4138	0.01347	1.50	0.757	57.4	0.59	2.35
3031605.	100922.	516541.	2.943	0.682	0.8641	83.045	0.6440	0.4145	0.01266	1.53	0.753	56.2	0.62	2.44
3542574.	120528.	446158.	2.549	0.682	0.5598	80.990	0.6352	0.4145	0.01087	1.53	0.752	56.9	0.69	2.47
3940123.	168870.	471354.	2.921	0.684	0.3995	63.071	0.5939	0.4113	0.00922	1.46	0.762	60.7	0.75	2.35
4215082.	213873.	477708.	1.401	0.685	0.2877	52.622	0.5193	0.4094	0.00797	1.43	0.764	63.1	0.79	2.30
4383882.	27564.	519812.	1.046	0.686	0.2177	41.363	0.4612	0.4067	0.00697	1.39	0.769	66.6	0.82	2.21
4468868.	315318.	515669.	0.852	0.686	0.1621	35.840	0.4184	0.4068	0.00619	1.39	0.757	67.9	0.83	2.23

TABLE IV. - Continued. UNIFORMLY

(c) Continued. Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	P8	T6	ROD	VELOC	M	X2	TO	TW	H	H/HHK	H/HMw	H/HF	TW/T8	THETA	ROFM
RUN 26- 287 WEIGHT FLOW, 0.1280 HEAT INPUT, 15.50 INLET BULK TEMP, 52.5 OUTLET BULK TEMP, 65.7 PLOT CH Q															
2.50	262.4	55.1	3.607	58.0	0.021	0.0286	251.	213.	0.00328	2.75	0.82	3.13	3.87	0.054	3.12
4.50	262.1	57.0	3.440	60.8	0.024	0.0378	311.	275.	0.00257	2.17	0.66	2.65	4.82	0.031	2.68
6.50	261.8	58.7	3.251	64.3	0.028	0.0503	386.	352.	0.00208	1.61	0.54	2.20	6.01	0.017	2.18
8.50	260.8	60.2	3.033	69.0	0.033	0.0676	492.	458.	0.00171	1.16	0.45	1.87	7.61	0.008	1.64
9.50	260.2	60.8	2.914	71.8	0.036	0.0786	496.	461.	0.00170	1.10	0.42	1.81	7.58	0.007	1.49
10.50	259.8	61.4	2.795	74.8	0.039	0.0910	482.	448.	0.00174	1.09	0.37	1.78	7.30	0.005	1.38
11.50	259.3	61.9	2.675	78.2	0.043	0.1048	473.	439.	0.00177	1.07	0.36	1.74	7.10	0.004	1.27
13.50	258.5	62.6	2.436	85.8	0.052	0.1372	422.	409.	0.00187	1.07	0.31	1.67	6.53	0.002	1.10
15.50	258.1	63.1	2.210	94.6	0.061	0.1752	440.	387.	0.00195	1.05	0.30	1.58	6.13	0.001	0.96
17.50	257.5	63.6	2.002	104.4	0.069	0.2168	401.	368.	0.00204	1.03	0.31	1.50	5.79	-0.001	0.84
19.50	257.1	64.2	1.816	115.1	0.078	0.2616	371.	337.	0.00220	1.06	0.37	1.47	5.26	-0.003	0.77
21.50	256.5	64.7	1.650	126.7	0.087	0.3089	351.	317.	0.00232	1.07	0.34	1.43	4.90	-0.005	0.71
RUN 27- 288 WEIGHT FLOW, 0.1570 HEAT INPUT, 16.00 INLET BULK TEMP, 51.2 OUTLET BULK TEMP, 64.2 PLOT CH R															
2.50	243.1	53.6	3.696	59.4	0.025	0.0227	215.	177.	0.00444	3.13	0.90	3.46	3.31	0.075	3.35
4.50	242.9	55.3	3.556	72.1	0.027	0.0291	248.	209.	0.00371	2.76	0.75	3.16	3.79	0.049	3.05
6.50	242.7	56.8	3.406	75.3	0.031	0.0371	265.	227.	0.00343	2.53	0.66	2.98	3.99	0.035	2.78
8.50	242.1	58.2	3.244	79.1	0.034	0.0472	312.	275.	0.00284	2.03	0.55	2.56	4.73	0.021	2.38
9.50	241.7	58.8	3.157	81.2	0.037	0.0533	336.	300.	0.00262	1.82	0.50	2.38	5.10	0.016	2.19
10.50	241.1	59.4	3.065	83.7	0.040	0.0602	379.	345.	0.00232	1.52	0.45	2.12	5.81	0.012	1.93
11.50	240.5	59.9	2.969	86.4	0.043	0.0682	393.	359.	0.00225	1.41	0.42	2.03	5.99	0.009	1.77
13.50	239.3	60.8	2.763	92.8	0.050	0.0877	449.	415.	0.00201	1.12	0.35	1.80	6.83	0.005	1.41
15.50	238.2	61.4	2.548	100.7	0.060	0.1124	429.	395.	0.00209	1.11	0.29	1.73	6.44	0.003	1.22
17.50	237.3	61.8	2.335	109.8	0.070	0.1424	407.	373.	0.00219	1.09	0.25	1.67	6.04	0.002	1.08
19.50	236.4	62.4	2.135	120.1	0.080	0.1758	373.	338.	0.00238	1.15	0.26	1.66	5.45	0.001	0.98
21.50	235.4	62.4	1.953	131.3	0.090	0.2117	350.	315.	0.00254	1.17	0.26	1.63	5.05	0.000	0.89
RUN 28- 681 WEIGHT FLOW, 0.1757 HEAT INPUT, 17.40 INLET BULK TEMP, 45.1 OUTLET BULK TEMP, 61.7 PLOT CH S															
2.50	239.8	48.1	4.041	71.0	0.022	0.0109	238.	209.	0.00376	2.85	0.96	3.21	4.35	0.091	3.76
4.50	239.6	50.3	3.915	73.3	0.024	0.0145	283.	255.	0.00307	2.42	0.80	2.86	5.07	0.060	3.48
6.50	239.3	52.3	3.780	75.9	0.026	0.0191	334.	307.	0.00256	1.96	0.68	2.47	5.87	0.040	3.14
8.50	238.8	54.3	3.632	79.0	0.029	0.0251	413.	388.	0.00207	1.45	0.56	2.05	7.16	0.025	2.71
9.50	238.5	55.2	3.552	80.8	0.031	0.0288	466.	441.	0.00186	1.23	0.52	1.89	7.98	0.019	2.46
10.50	238.3	56.1	3.468	82.8	0.033	0.0331	542.	516.	0.00164	1.03	0.47	1.76	9.20	0.014	2.17
11.50	238.0	56.9	3.378	85.0	0.035	0.0380	556.	530.	0.00161	0.97	0.44	1.73	9.30	0.012	2.00
13.50	237.4	58.4	3.196	89.8	0.040	0.0476	509.	482.	0.00174	0.99	0.40	1.69	8.26	0.010	1.81
15.50	236.7	59.6	3.011	95.3	0.046	0.0636	472.	446.	0.00186	1.02	0.37	1.68	7.49	0.008	1.63
17.50	236.0	60.4	2.823	101.7	0.054	0.0806	459.	434.	0.00191	0.99	0.32	1.63	7.18	0.005	1.43
19.50	235.3	61.1	2.632	109.1	0.063	0.1009	416.	392.	0.00209	1.05	0.28	1.64	6.42	0.004	1.31
21.50	234.6	61.5	2.440	117.6	0.073	0.1254	417.	392.	0.00209	0.98	0.23	1.55	6.38	0.003	1.13
RUN 30- 886 WEIGHT FLOW, 0.0970 HEAT INPUT, 43.40 INLET BULK TEMP, 52.1 OUTLET BULK TEMP, 172.8 PLOT CH U															
2.50	318.2	60.5	3.215	49.3	0.021	0.0633	467.	390.	0.00423	3.57	1.45	4.84	6.44	0.017	2.05
4.50	317.9	64.6	2.813	60.7	0.033	0.1347	502.	430.	0.00393	2.67	1.04	3.97	6.66	0.004	1.25
6.50	317.4	67.4	2.000	79.2	0.049	0.2572	626.	552.	0.00323	1.74	0.89	3.02	8.19	-0.003	0.64
8.50	316.4	70.7	1.506	105.3	0.066	0.4147	612.	538.	0.00331	1.51	0.99	2.45	7.61	-0.010	0.43
9.50	315.7	73.2	1.303	121.6	0.075	0.5002	850.	773.	0.00257	1.09	1.01	2.21	10.56	-0.010	0.26
10.50	315.1	76.6	1.126	140.8	0.084	0.5867	917.	839.	0.00245	0.99	1.07	2.01	10.95	-0.014	0.21
11.50	314.3	80.9	0.980	161.6	0.092	0.6647	949.	870.	0.00241	0.93	1.13	1.83	10.76	-0.019	0.18
13.50	312.4	91.3	0.769	206.0	0.109	0.7843	934.	855.	0.00246	0.90	1.21	1.55	9.38	-0.033	0.15
15.50	310.5	103.5	0.629	252.0	0.123	0.8613	932.	854.	0.00251	0.88	1.24	1.36	8.25	-0.050	0.14
17.50	308.6	116.4	0.533	297.0	0.136	0.9083	901.	824.	0.00261	0.87	1.22	1.23	7.08	-0.072	0.13
19.50	306.7	129.4	0.465	340.9	0.150	0.9376	863.	787.	0.00275	0.87	1.17	1.14	6.38	-0.097	0.13
21.50	304.7	142.6	0.412	384.5	0.162	0.9565	853.	776.	0.00284	0.86	1.15	1.08	5.45	-0.122	0.13
RUN 32- 312 WEIGHT FLOW, 0.1280 HEAT INPUT, 42.80 INLET BULK TEMP, 47.1 OUTLET BULK TEMP, 121.6 PLOT CH W															
2.50	327.0	55.4	3.691	56.7	0.020	0.0301	384.	304.	0.00557	4.32	1.76	5.16	5.49	0.045	3.01
4.50	326.5	60.3	3.264	64.1	0.027	0.0603	458.	381.	0.00457	3.10	1.28	4.12	6.32	0.019	2.14
6.50	325.8	63.9	2.785	75.1	0.038	0.1126	537.	455.	0.00395	2.23	0.95	3.37	7.12	0.006	1.38
8.50	324.5	66.5	2.262	92.5	0.054	0.2010	687.	608.	0.00315	1.46	0.74	2.73	9.15	-0.000	0.74
9.50	323.8	67.7	2.066	104.3	0.064	0.2599	764.	685.	0.00290	1.22	0.73	2.48	10.12	-0.002	0.54
10.50	323.1	69.1	1.770	118.2	0.074	0.3268	788.	709.	0.00284	1.11	0.74	2.27	10.26	-0.004	0.43
11.50	322.5	70.7	1.558	134.3	0.084	0.3999	887.	807.	0.00261	0.96	0.77	2.12	11.40	-0.006	0.32
13.50	321.0	75.2	1.222	171.2	0.103	0.5442	839.	759.	0.00274	0.91	0.86	1.75	10.09	-0.013	0.25
15.50	319.7	81.3	0.992	210.9	0.120	0.6635	796.	707.	0.00290	0.89	0.97	1.48	8.70	-0.024	0.22
17.50	318.1	88.5	0.830	252.0	0.135	0.7542	745.	666.	0.00307	0.88	1.03	1.32	7.53	-0.039	0.20
19.50	316.6	96.6	0.712	293.7	0.149	0.8139	705.	626.	0.00326	0.87	1.08	1.20	6.48	-0.058	0.19
21.50	315.2	105.3	0.624	335.3	0.162	0.8670	690.	612.	0.00338	0.85	1.11	1.11	5.81	-0.078	0.19
RUN 34- 273 WEIGHT FLOW, 0.1860 HEAT INPUT, 42.60 INLET BULK TEMP, 48.4 OUTLET BULK TEMP, 91.8 PLOT CH Y															
2.50	408.3	54.7	3.841	79.1	0.020	0.0270	341.	250.	0.00741	3.54	1.70	3.92	4.58	0.079	3.41
4.50	407.8	59.1	3.551	85.6	0.031	0.0467	499.	416.	0.00456	2.18	1.16	2.79	7.04	0.031	2.55
6.50	406.9	63.1	3.209	94.7	0.039	0.0793	689.	595.	0.00344	1.52	0.89	2.38	9.44	0.010	1.68
8.50	405.9	66.5	2.827	107.5	0.050	0.1294	770.	685.	0.00312	1.21	0.74	2.17	10.30	0.006	1.12
9.50	405.4	68.0	2.634	115.4	0.058	0.1614	732.	647.	0.00326	1.18	0.70	2.05	9.52	0.003	0.99
10.50	404.8	69.3	2.449	124.1	0.065	0.1973	670.	589.	0.00353	1.21	0.67	1.97	8.44	0.001	0.91
11.50	404.2	70.5	2.275	133.6	0.073	0.2364	652.	567.	0.00362	1.17	0.67	1.87	8.05	-0.001	0.81
13.50	402.8	72.9	1.966	154.6	0.087	0.3169	591.	507.	0.00399	1.16	0.69	1.72	6.95	-0.007	0.69
15.50	400.9	75.4	1.706	178.2	0.102	0.4046	557.	473.	0.00426	1.12	0.72	1.58	6.27	-0.014	0.59
17.50	399.2	78.3	1.491	203.8	0.115	0.4884	527.	443.	0.00455	1.11	0.78	1.48	5.66	-0.024	0.53
19.50	397.8	81.6	1.319	230.4	0.128	0.5645	475.	392.	0.00516	1.18	0.86	1.46	4.81	-0.038	0.51
21.50	396.7	85.2	1.180	257.5	0.139	0.6308	432.	348.	0.00592	1.25	0.95	1.47	4.08	-0.060	0.50

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q <sub>W</sub> L	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.00 TEST VOLTAGE, 18.0 HEAT INPUT/UNIT AREA, 0.673 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1128613.	267376.	2199096.	1.330	0.621	8.1919	9.458	0.3317	0.2972	0.01032	0.52	0.563	74.7	0.39	1.65
1256254.	192250.	1720561.	1.413	0.650	5.5603	15.364	0.3617	0.3187	0.01075	0.56	0.550	66.9	0.37	1.64
1413063.	139998.	1281274.	1.547	0.674	3.7543	24.835	0.4003	0.3568	0.01087	0.61	0.533	60.0	0.35	1.71
1610426.	100692.	884975.	1.771	0.686	2.4755	42.201	0.4523	0.3958	0.01077	0.68	0.514	53.3	0.35	1.93
1724255.	103138.	831566.	1.934	0.686	2.1305	44.077	0.4840	0.3971	0.01046	0.68	0.512	53.4	0.36	1.94
1843198.	111869.	810213.	2.146	0.686	1.8724	43.147	0.5201	0.3930	0.01009	0.67	0.513	54.4	0.38	1.92
1966066.	120111.	794952.	2.457	0.685	1.6432	42.644	0.5641	0.3902	0.00972	0.67	0.513	55.2	0.39	1.90
2128374.	145825.	788512.	3.401	0.683	1.2915	38.370	0.6719	0.3804	0.00896	0.65	0.520	57.5	0.44	1.83
2461594.	173846.	778288.	3.391	0.681	1.0234	34.908	0.6934	0.3731	0.00825	0.63	0.528	59.3	0.48	1.77
2680507.	205460.	776723.	3.113	0.679	0.8263	31.764	0.6858	0.3668	0.00761	0.62	0.537	61.1	0.52	1.71
2870699.	256428.	826281.	2.901	0.672	0.6911	26.569	0.6783	0.3517	0.00700	0.60	0.553	64.1	0.57	1.60
3032923.	307085.	859788.	2.445	0.668	0.5777	23.132	0.6418	0.3418	0.00648	0.59	0.568	66.4	0.61	1.53
HEAT BALANCE, -0.24 TEST VOLTAGE, 18.0 HEAT INPUT/UNIT AREA, 0.663 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1308569.	393542.	3148337.	1.304	0.607	10.7492	7.205	0.3177	0.2906	0.00949	0.55	0.554	95.1	0.39	1.68
1433216.	317637.	2721073.	1.366	0.623	7.8387	10.064	0.3417	0.2930	0.00984	0.57	0.531	88.9	0.37	1.63
1576700.	292272.	2466948.	1.456	0.631	6.0015	12.152	0.3703	0.2959	0.00987	0.58	0.526	86.6	0.38	1.59
1744113.	229783.	1992477.	1.591	0.654	4.3427	17.775	0.4056	0.3170	0.01000	0.62	0.515	79.5	0.37	1.59
1839070.	207467.	1780144.	1.685	0.662	3.7076	21.104	0.4268	0.3286	0.01001	0.63	0.510	76.6	0.37	1.61
1943505.	173006.	1498913.	1.804	0.675	3.0700	27.504	0.4512	0.3520	0.01000	0.66	0.498	71.8	0.36	1.68
2056944.	167996.	1386581.	1.956	0.678	2.6696	30.153	0.4791	0.3590	0.00984	0.67	0.495	70.7	0.36	1.70
2309656.	144200.	1082073.	2.437	0.684	1.9393	41.052	0.5513	0.3807	0.00949	0.71	0.483	66.2	0.36	1.83
2588712.	166842.	1050943.	3.550	0.683	1.5470	38.756	0.6705	0.3742	0.00889	0.70	0.489	68.2	0.40	1.78
2874908.	197312.	1041477.	4.785	0.681	1.2468	35.920	0.7830	0.3666	0.00829	0.68	0.498	70.4	0.44	1.72
3145312.	248301.	1103203.	4.387	0.674	1.0440	30.535	0.7765	0.3494	0.00768	0.66	0.513	74.1	0.49	1.60
3389076.	299044.	1142593.	4.236	0.669	0.8770	26.853	0.7810	0.3377	0.00716	0.64	0.528	77.0	0.54	1.52
HEAT BALANCE, 0.03 TEST VOLTAGE, 23.3 HEAT INPUT/UNIT AREA, 0.752 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1161819.	326037.	3372750.	1.219	0.620	19.2991	8.355	0.2673	0.2915	0.00989	0.61	0.533	90.8	0.29	1.77
1266466.	246822.	2865676.	1.239	0.642	13.9882	12.349	0.2843	0.3038	0.01026	0.63	0.513	84.1	0.28	1.74
1386175.	191191.	2395451.	1.776	0.623	9.4431	17.907	0.3044	0.3288	0.01040	0.65	0.493	78.1	0.26	1.73
1527074.	138590.	1862651.	1.333	0.681	6.5166	28.184	0.3285	0.3693	0.01034	0.69	0.464	70.8	0.25	1.79
1607986.	116572.	1600765.	1.371	0.686	5.3809	36.891	0.3426	0.3875	0.01025	0.72	0.447	67.0	0.24	1.86
1697891.	93643.	1313479.	1.420	0.687	4.3611	49.503	0.3586	0.4041	0.01019	0.75	0.431	62.4	0.23	1.98
1796637.	71997.	1220973.	1.482	0.687	3.7781	53.389	0.3766	0.4051	0.01002	0.76	0.426	62.1	0.24	2.01
2012008.	111285.	1235275.	1.652	0.688	3.0866	48.536	0.4183	0.4020	0.00953	0.74	0.428	65.9	0.26	1.96
2247423.	132055.	1238138.	1.906	0.687	2.5349	44.948	0.4685	0.3907	0.00909	0.72	0.431	69.2	0.29	1.89
2503263.	146134.	1178132.	2.300	0.686	2.0453	44.89C	0.5311	0.3868	0.00865	0.71	0.433	70.7	0.32	1.87
2775969.	181360.	1229410.	3.083	0.683	1.7226	38.223	0.6234	0.3726	0.00822	0.69	0.446	74.7	0.35	1.77
3061695.	194309.	1138214.	4.574	0.683	1.3789	32.304	0.7565	0.3729	0.00775	0.69	0.448	74.9	0.38	1.77
HEAT BALANCE, -0.10 TEST VOLTAGE, 39.5 HEAT INPUT/UNIT AREA, 1.866 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1087328.	110469.	861598.	1.475	0.676	3.1527	24.381	0.3379	0.3771	0.02652	1.39	1.415	46.4	0.94	1.80
1516857.	115938.	806119.	1.987	0.681	1.4237	33.333	0.5244	0.3911	0.02261	1.43	1.360	45.6	1.09	1.90
1975569.	103332.	348060.	1.734	0.684	0.6132	50.626	0.5646	0.4099	0.01822	1.56	1.284	41.1	1.18	2.24
2287945.	140850.	314690.	1.312	0.684	0.3278	42.433	0.5004	0.4093	0.01425	1.55	1.275	42.7	1.31	2.25
2379076.	91875.	176344.	1.025	0.693	0.2004	70.140	0.4549	0.4070	0.01309	1.80	1.204	36.2	1.33	2.71
2426168.	72648.	153587.	0.837	0.694	0.1414	70.959	0.4159	0.4042	0.01171	1.87	1.174	35.6	1.36	2.83
2430347.	99696.	147003.	0.725	0.692	0.1041	65.915	0.3850	0.4042	0.01048	1.90	1.136	35.9	1.35	2.90
2351432.	127085.	166012.	0.624	0.692	0.0632	49.006	0.3424	0.4042	0.00841	1.88	1.055	38.4	1.29	2.90
2216902.	151731.	174626.	0.595	0.692	0.0416	37.870	0.3167	0.4041	0.00703	1.88	0.976	41.0	1.22	2.92
2076548.	183314.	200399.	0.596	0.693	0.0304	28.500	0.3066	0.4041	0.00601	1.85	0.912	44.2	1.15	2.89
1947981.	218242.	231360.	0.607	0.694	0.0240	21.707	0.3049	0.4041	0.00525	1.81	0.864	47.7	1.09	2.85
1832663.	243466.	253035.	0.619	0.694	0.0200	17.819	0.3063	0.4041	0.00471	1.80	0.821	50.4	1.05	2.85
HEAT BALANCE, -0.04 TEST VOLTAGE, 38.8 HEAT INPUT/UNIT AREA, 1.817 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1064247.	191889.	1690038.	1.772	0.691	7.2788	13.339	0.3159	0.3378	0.02253	1.39	1.310	62.7	0.76	1.73
1390968.	152342.	1146960.	1.436	0.674	3.3820	22.510	0.3873	0.3747	0.02104	1.47	1.209	58.5	0.79	1.79
1828561.	135338.	801865.	1.745	0.683	1.6804	34.887	0.4798	0.3992	0.01868	1.55	1.137	55.1	0.85	1.96
2348630.	106636.	443214.	2.083	0.682	0.7848	57.351	0.5652	0.4134	0.01597	1.71	1.067	48.6	0.92	2.34
2594573.	99926.	360902.	1.872	0.680	0.5475	71.039	0.5568	0.4149	0.01463	1.79	1.045	46.2	0.97	2.51
2803594.	106852.	299813.	1.663	0.679	0.4027	71.939	0.5414	0.4140	0.01321	1.82	1.035	45.9	1.02	2.58
2969606.	97056.	229031.	1.557	0.697	0.2838	83.311	0.5056	0.4048	0.01210	1.92	1.031	43.5	1.09	2.74
3156353.	135076.	239456.	0.916	0.690	0.1750	63.074	0.4334	0.4084	0.00965	1.87	0.996	46.3	1.12	2.70
3186840.	184759.	271623.	0.725	0.679	0.1175	46.072	0.3854	0.4136	0.00794	1.82	0.956	49.8	1.10	2.65
3125932.	236275.	307648.	0.642	0.680	0.0834	34.419	0.3531	0.4147	0.00672	1.77	0.920	53.5	1.07	2.60
3018309.	294641.	354222.	0.607	0.682	0.0624	25.841	0.3308	0.4158	0.00582	1.73	0.888	57.7	1.04	2.54
2891300.	339614.	387178.	0.573	0.682	0.0474	20.934	0.3153	0.4157	0.00515	1.71	0.852	61.0	1.01	2.53
HEAT BALANCE, -0.02 TEST VOLTAGE, 38.0 HEAT INPUT/UNIT AREA, 1.819 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1395140.	437108.	2912682.	1.221	0.613	9.9238	7.297	0.2330	0.3274	0.01369	1.45	1.086	92.6	0.66	1.76
1680839.	221397.	1775512.	1.271	0.672	4.5805	19.196	0.3339	0.3905	0.01364	1.63	0.951	74.7	0.55	1.87
2070462.	141450.	1045727.	1.357	0.680	2.3067	39.298	0.3861	0.4151	0.01293	1.83	0.863	64.5	0.54	2.17
2560001.	124407.	724478.	1.454	0.678	1.1196	54.259	0.4417	0.4169	0.01189	1.93	0.826	61.7	0.60	2.40
2820311.	149469.	710055.	1.520	0.679	1.0792	50.735	0.4688	0.4180	0.01109	1.89	0.823	64.2	0.64	2.38
3071260.	186240.	746909.	1.582	0.680	0.9135	43.464	0.4919	0.4148	0.01035	1.82	0.829	68.2	0.69	2.29
3303452.	208938.	726238.	1.533	0.680	0.7556	41.319	0.4977	0.4139	0.00972	1.80	0.829	69.8	0.73	2.28
3686826.	282907.	763542.	1.358	0.680	0.5532	33.112	0.4890	0.4111	0.00858	1.73	0.842	75.2	0.80	2.18
3963848.	356167.	785391.	1.179	0.680	0.4109	27.669	0.4703	0.4096	0.00765	1.69	0.851	79.1	0.86	2.13
4143093.	441318.	826637.	0.987	0.678	0.3141	22.798	0.4420	0.4038	0.00687	1.66	0.861	83.3	0.91	2.06
4238909.	585194.	910092.	0.845	0.673	0.2550	16.489	0.4157	0.3894	0.00630	1.60	0.895	90.4	0.99	1.91
4272487.	759493.	1126917.	0.751	0.666	0.2126	12.207	0.3743	0.3772	0.00586	1.55	0.942	98.1	1.08	1.78

TABLE IV. - Continued. UNIFORMLY

(c) Continued. Test section 3; tube inside diameter, 0.335 inch; tube outside

FL	Pu	Td	RDB	VELOC	M	X2	TQ	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	ROFM
RUN 43- 688 WEIGHT FLOW, 0.0984 HEAT INPUT, 29.00 INLET BULK TEMP, 50.0 OUTLET BULK TEMP, 118.2 PLOT CH B															
2.50	492.5	58.2	3.730	43.1	0.014	0.0390	477.	424.	0.00282	2.09	1.33	2.56	7.29	0.043	2.88
4.50	492.2	63.7	3.354	47.9	0.018	0.0749	625.	571.	0.00223	1.57	1.01	2.22	8.98	0.020	1.96
6.50	491.8	68.4	2.938	54.7	0.024	0.1324	745.	692.	0.00195	1.23	0.82	2.01	10.11	-0.009	1.25
8.50	491.3	72.7	2.508	64.1	0.031	0.2154	831.	777.	0.00181	1.01	0.71	1.84	10.69	0.002	0.80
9.50	491.1	74.6	2.301	69.9	0.035	0.2666	826.	771.	0.00182	0.95	0.70	1.72	10.33	-0.001	0.68
10.50	490.8	76.6	2.113	76.1	0.039	0.3197	759.	706.	0.00195	0.94	0.70	1.59	9.21	-0.005	0.62
11.50	490.5	78.6	1.946	82.6	0.043	0.3728	716.	662.	0.00205	0.93	0.71	1.49	8.42	-0.008	0.58
13.50	489.9	82.8	1.665	96.5	0.051	0.4704	650.	596.	0.00224	0.92	0.75	1.35	7.20	-0.018	0.51
15.50	489.4	87.5	1.445	111.3	0.057	0.5700	604.	550.	0.00242	0.91	0.79	1.24	6.29	-0.030	0.46
17.50	488.7	92.8	1.270	126.6	0.063	0.6502	594.	540.	0.00249	0.87	0.82	1.14	5.82	-0.043	0.41
19.50	488.0	98.6	1.129	142.4	0.069	0.7169	568.	515.	0.00263	0.86	0.86	1.08	5.22	-0.060	0.39
21.50	487.3	105.0	1.014	158.6	0.074	0.7712	564.	510.	0.00269	0.83	0.88	1.01	4.86	-0.077	0.36
RUN 45- 649 WEIGHT FLOW, 0.1274 HEAT INPUT, 31.44 INLET BULK TEMP, 50.5 OUTLET BULK TEMP, 99.6 PLOT CH *															
2.50	411.1	57.1	3.692	56.4	0.019	0.0365	454.	396.	0.00333	2.23	1.21	2.76	6.93	0.039	2.84
4.50	410.4	61.5	3.361	61.9	0.024	0.0639	571.	511.	0.00271	1.66	0.94	2.37	8.31	0.019	2.05
6.50	409.6	65.2	2.991	69.6	0.031	0.1067	679.	613.	0.00235	1.30	0.76	2.13	9.49	0.009	1.37
8.50	408.7	68.4	2.600	80.0	0.040	0.1686	738.	678.	0.00221	1.07	0.65	1.92	9.92	0.003	0.93
9.50	408.2	69.7	2.406	86.5	0.046	0.2079	743.	683.	0.00220	1.00	0.62	1.82	9.80	0.001	0.79
10.50	407.6	71.4	2.222	93.7	0.051	0.2510	711.	651.	0.00229	0.98	0.62	1.71	9.16	-0.002	0.70
11.50	407.3	72.4	2.054	101.3	0.057	0.2955	674.	615.	0.00240	0.97	0.62	1.62	8.49	-0.004	0.64
13.50	406.3	75.2	1.743	118.0	0.067	0.3874	627.	567.	0.00256	0.95	0.65	1.47	7.55	-0.010	0.54
15.50	405.2	78.2	1.527	136.3	0.077	0.4778	578.	518.	0.00278	0.94	0.70	1.35	6.63	-0.019	0.48
17.50	404.1	81.8	1.336	155.8	0.086	0.5611	568.	509.	0.00285	0.90	0.74	1.23	6.22	-0.028	0.42
19.50	403.0	85.9	1.183	176.0	0.094	0.6343	529.	469.	0.00309	0.90	0.79	1.16	5.46	-0.042	0.40
21.50	401.8	90.4	1.057	196.9	0.102	0.6970	530.	471.	0.00312	0.86	0.81	1.08	5.21	-0.054	0.36
RUN 47- 653 WEIGHT FLOW, 0.1830 HEAT INPUT, 31.19 INLET BULK TEMP, 47.7 OUTLET BULK TEMP, 79.9 PLOT CH B															
2.50	412.8	52.8	3.748	75.7	0.023	0.0214	424.	364.	0.00360	1.91	1.10	2.27	6.88	0.056	3.37
4.50	412.2	56.6	3.727	80.2	0.027	0.0342	593.	532.	0.00263	1.36	0.86	1.90	9.40	0.029	2.66
6.50	411.6	60.2	3.471	86.1	0.032	0.0538	755.	694.	0.00218	1.07	0.71	1.79	11.54	0.016	1.94
8.50	410.9	63.3	3.195	93.6	0.039	0.0815	727.	667.	0.00225	1.00	0.62	1.69	10.53	0.011	1.56
9.50	410.5	64.7	3.056	97.8	0.042	0.0982	703.	642.	0.00232	0.98	0.59	1.64	9.93	0.010	1.42
10.50	410.0	65.9	2.920	102.4	0.046	0.1166	648.	588.	0.00248	1.00	0.57	1.60	8.92	0.008	1.34
11.50	409.6	67.0	2.788	107.2	0.051	0.1365	613.	553.	0.00261	1.01	0.55	1.56	8.26	0.007	1.25
13.50	408.7	68.9	2.533	118.0	0.061	0.1816	564.	504.	0.00283	0.99	0.52	1.48	7.31	0.003	1.08
15.50	407.7	70.5	2.294	130.3	0.071	0.2344	524.	464.	0.00305	0.98	0.51	1.40	6.58	-0.001	0.95
17.50	406.7	72.2	2.076	144.0	0.080	0.2892	514.	454.	0.00312	0.94	0.51	1.32	6.29	-0.006	0.82
19.50	405.6	73.9	1.881	159.0	0.090	0.3471	475.	416.	0.00339	0.97	0.53	1.29	5.63	-0.011	0.75
21.50	404.5	75.7	1.708	175.1	0.100	0.4063	472.	413.	0.00343	0.92	0.55	1.21	5.46	-0.017	0.66
RUN 55- 258 WEIGHT FLOW, 0.0959 HEAT INPUT, 15.40 INLET BULK TEMP, 48.8 OUTLET BULK TEMP, 78.0 PLOT CH J															
2.50	408.2	53.1	3.728	39.9	0.012	0.0223	245.	208.	0.00327	2.43	1.22	2.61	3.91	0.110	3.63
4.50	407.9	56.3	3.740	41.9	0.014	0.0331	310.	275.	0.00251	2.06	0.97	2.32	4.88	0.063	3.19
6.50	407.7	59.4	3.524	44.5	0.016	0.0489	415.	383.	0.00191	1.54	0.78	1.91	6.44	0.033	2.57
8.50	407.3	62.4	3.277	47.8	0.019	0.0719	500.	466.	0.00167	1.24	0.66	1.71	7.47	0.019	2.00
9.50	407.2	63.7	3.145	49.8	0.021	0.0866	512.	478.	0.00164	1.17	0.62	1.65	7.50	0.015	1.79
10.50	407.0	65.0	3.012	52.0	0.023	0.1032	501.	467.	0.00168	1.15	0.59	1.61	7.18	0.013	1.64
11.50	406.9	66.1	2.881	54.4	0.025	0.1216	491.	458.	0.00171	1.12	0.56	1.57	6.92	0.010	1.50
13.50	406.6	68.1	2.624	59.7	0.030	0.1635	454.	422.	0.00182	1.11	0.52	1.51	6.19	0.005	1.30
15.50	406.1	69.8	2.381	65.8	0.035	0.2125	428.	396.	0.00192	1.09	0.50	1.44	5.67	0.001	1.13
17.50	405.9	71.5	2.159	72.6	0.040	0.2663	413.	381.	0.00199	1.05	0.50	1.37	5.33	-0.005	0.99
19.50	405.4	73.1	1.960	79.9	0.045	0.3222	383.	350.	0.00216	1.06	0.52	1.33	4.79	-0.011	0.90
21.50	405.1	74.8	1.785	87.8	0.050	0.3791	368.	335.	0.00226	1.04	0.53	1.28	4.48	-0.019	0.82
RUN 56- 259 WEIGHT FLOW, 0.1270 HEAT INPUT, 15.90 INLET BULK TEMP, 46.5 OUTLET BULK TEMP, 72.8 PLOT CH K															
2.50	457.8	50.2	4.119	50.4	0.015	0.0148	176.	136.	0.00605	1.99	1.60	2.06	2.71	0.258	4.05
4.50	457.6	53.0	3.783	52.1	0.016	0.0212	218.	179.	0.00436	2.05	1.22	2.16	3.37	0.153	3.79
6.50	457.4	55.7	3.437	54.1	0.017	0.0296	258.	218.	0.00355	1.93	1.01	2.08	3.92	0.102	3.49
8.50	457.0	58.3	3.179	56.4	0.019	0.0407	297.	258.	0.00303	1.74	0.86	1.93	4.43	0.070	3.14
9.50	456.7	59.5	3.056	57.7	0.020	0.0474	316.	278.	0.00283	1.64	0.80	1.84	4.67	0.058	2.96
10.50	456.4	60.7	2.911	59.1	0.021	0.0549	318.	280.	0.00283	1.61	0.77	1.82	4.61	0.052	2.82
11.50	456.1	61.9	2.722	60.6	0.023	0.0634	369.	333.	0.00243	1.39	0.69	1.64	5.38	0.038	2.54
13.50	455.6	64.2	2.331	64.2	0.026	0.0845	428.	393.	0.00213	1.17	0.60	1.46	6.12	0.024	2.10
15.50	455.3	66.3	2.028	68.5	0.029	0.1110	466.	431.	0.00199	1.04	0.54	1.36	6.49	0.016	1.74
17.50	455.0	68.3	1.824	73.5	0.034	0.1426	454.	418.	0.00205	1.00	0.51	1.31	6.13	0.011	1.53
19.50	454.7	70.0	1.629	78.9	0.038	0.1779	395.	360.	0.00233	1.07	0.50	1.32	5.14	0.007	1.45
21.50	454.4	71.6	1.448	84.8	0.043	0.2164	369.	333.	0.00252	1.08	0.49	1.32	4.65	0.002	1.34
RUN 57- 881 WEIGHT FLOW, 0.1390 HEAT INPUT, 53.80 INLET BULK TEMP, 51.0 OUTLET BULK TEMP, 156.3 PLOT CH L															
2.50	705.1	62.8	3.717	61.1	0.019	0.0482	762.	673.	0.00331	1.69	1.47	2.27	10.71	0.033	2.60
4.50	704.7	70.7	3.254	69.8	0.025	0.1104	928.	835.	0.00290	1.40	1.16	2.19	11.82	0.016	1.57
6.50	704.1	77.9	2.770	82.0	0.034	0.2060	1058.	952.	0.00270	1.13	1.00	1.99	12.22	0.006	0.94
8.50	703.2	84.6	2.335	97.3	0.043	0.3242	903.	812.	0.00301	1.09	0.93	1.73	9.60	-0.002	0.74
9.50	702.6	87.9	2.145	105.9	0.048	0.3865	982.	887.	0.00285	0.99	0.91	1.64	10.09	-0.006	0.60
10.50	702.0	91.4	1.972	115.2	0.052	0.4487	940.	847.	0.00295	0.97	0.91	1.54	9.27	-0.011	0.54
11.50	701.3	94.9	1.819	124.8	0.056	0.5079	911.	819.	0.00303	0.95	0.92	1.45	8.63	-0.016	0.50
13.50	700.0	102.4	1.567	144.9	0.064	0.6123	821.	750.	0.00326	0.93	0.94	1.31	7.32	-0.030	0.45
15.50	698.8	110.4	1.374	165.3	0.072	0.6940	841.	731.	0.00337	0.90	0.95	1.20	6.62	-0.044	0.41
17.50	697.6	118.8	1.224	185.5	0.079	0.7543	786.	697.	0.00354	0.87	0.95	1.11	5.87	-0.062	0.39
19.50	696.3	127.4	1.105	205.4	0.085	0.7975	716.	627.	0.00393	0.88	0.97	1.05	4.93	-0.089	0.40
21.50	695.1	136.1	1.008	225.2	0.091	0.9999	720.	631.	0.00398	0.85	0.96	1.01	4.63	-0.108	0.33

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-H	PHI-F	EFLUX	QDCL	H/H-H	SIMPLE	NU/NUT	TDLK
HEAT BALANCE, -0.05 TEST VOLTAGE, 32.8 HEAT INPUT/UNIT AREA, 1.225 ID, 0.335 OD, 0.375 LENGTH, 24.0														
789040.	129399.	992033.	1.214	0.666	5.8755	15.437	0.3365	0.3978	0.01417	1.03	0.993	44.1	0.53	1.90
995514.	90952.	628093.	1.255	0.676	2.7285	28.880	0.3572	0.4170	0.01332	1.13	0.896	39.7	0.54	2.13
1259500.	76790.	405726.	1.286	0.675	1.4101	44.052	0.4392	0.4188	0.01224	1.22	0.841	37.4	0.59	2.40
1548184.	73947.	280023.	1.309	0.692	0.7901	56.146	0.4511	0.4089	0.01092	1.27	0.815	36.4	0.68	2.59
1683182.	81192.	259182.	1.266	0.691	0.6190	55.363	0.4583	0.4094	0.01012	1.27	0.804	37.0	0.72	2.62
1797233.	101916.	277381.	1.179	0.675	0.5168	46.802	0.4544	0.4178	0.00927	1.23	0.794	39.2	0.75	2.58
1888403.	120979.	287887.	1.105	0.676	0.4344	40.785	0.4487	0.4196	0.00854	1.20	0.791	41.0	0.78	2.54
2012620.	163184.	312728.	0.950	0.676	0.3161	31.261	0.4290	0.4188	0.00740	1.15	0.789	44.4	0.82	2.44
2073991.	208501.	340637.	0.812	0.676	0.2381	24.483	0.4052	0.4170	0.00654	1.12	0.786	47.5	0.86	2.37
2090874.	240187.	349474.	0.719	0.676	0.1809	21.037	0.3846	0.4168	0.00583	1.11	0.770	49.4	0.86	2.37
2077579.	284214.	378677.	0.659	0.676	0.1440	17.179	0.3677	0.4160	0.00526	1.09	0.761	52.1	0.87	2.33
2044742.	314301.	392375.	0.622	0.676	0.1156	14.995	0.3540	0.4160	0.00477	1.09	0.743	54.0	0.86	2.34
HEAT BALANCE, -0.03 TEST VOLTAGE, 33.3 HEAT INPUT/UNIT AREA, 1.328 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1052259.	159187.	1344143.	1.242	0.668	5.9391	16.463	0.3134	0.3842	0.01425	1.13	0.930	55.6	0.51	1.85
1294571.	117749.	912943.	1.313	0.680	3.0788	28.897	0.3623	0.4111	0.01346	1.22	0.851	50.8	0.51	2.03
1605021.	97991.	611208.	1.409	0.680	1.6961	44.002	0.4182	0.4165	0.01247	1.30	0.801	47.5	0.55	2.26
1961299.	97232.	450575.	1.523	0.678	1.0095	54.576	0.4721	0.4172	0.01124	1.35	0.774	46.5	0.61	2.44
2140985.	103482.	408915.	1.563	0.678	0.7993	55.874	0.4930	0.4169	0.01054	1.35	0.767	46.8	0.64	2.48
2306539.	120001.	405351.	1.486	0.679	0.6594	51.356	0.4945	0.4182	0.00976	1.33	0.766	48.4	0.68	2.46
2449319.	141018.	413945.	1.389	0.680	0.5564	45.807	0.4896	0.4166	0.00909	1.30	0.768	50.2	0.72	2.40
2669184.	183217.	425482.	1.209	0.680	0.4025	37.606	0.4733	0.4143	0.00795	1.26	0.770	53.3	0.77	2.33
2809402.	238911.	460436.	1.005	0.680	0.3040	29.562	0.4444	0.4120	0.00703	1.22	0.777	56.9	0.81	2.25
2884225.	277223.	464615.	0.848	0.680	0.2293	25.786	0.4162	0.4116	0.00628	1.22	0.768	58.7	0.83	2.24
2909406.	346250.	518212.	0.746	0.680	0.1834	20.194	0.3929	0.4100	0.00567	1.19	0.774	62.6	0.85	2.17
2899184.	379197.	522034.	0.681	0.680	0.1443	16.143	0.3739	0.4102	0.00514	1.19	0.756	64.2	0.85	2.19
HEAT BALANCE, -0.05 TEST VOLTAGE, 32.8 HEAT INPUT/UNIT AREA, 1.296 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1278035.	247692.	2263851.	1.210	0.660	10.1475	12.862	0.2789	0.3713	0.01042	1.12	0.748	74.6	0.36	1.84
1477708.	146023.	1507867.	1.236	0.680	5.4217	27.151	0.3085	0.4119	0.01029	1.25	0.672	63.8	0.34	2.00
1737608.	103526.	1003313.	1.286	0.678	3.0949	46.388	0.3455	0.4169	0.01011	1.38	0.628	57.6	0.34	2.25
2052764.	118665.	895982.	1.356	0.679	2.1275	47.208	0.3877	0.4180	0.00937	1.36	0.612	60.3	0.38	2.29
2222661.	130756.	868963.	1.392	0.679	1.8077	45.987	0.4086	0.4177	0.00898	1.34	0.608	62.1	0.40	2.29
2395562.	158666.	903158.	1.424	0.680	1.5947	40.873	0.4279	0.4149	0.00858	1.30	0.610	65.5	0.43	2.22
2567900.	178156.	914668.	1.455	0.680	1.4009	37.827	0.4459	0.4133	0.00823	1.27	0.611	68.1	0.46	2.18
2906426.	223525.	921658.	1.547	0.680	1.0852	33.365	0.4809	0.4110	0.00759	1.23	0.617	72.3	0.50	2.12
3222217.	276538.	935382.	1.528	0.679	0.8522	29.265	0.4958	0.4080	0.00700	1.20	0.626	76.3	0.55	2.06
3494200.	312951.	897523.	1.403	0.678	0.6652	27.772	0.4906	0.4055	0.00646	1.19	0.627	78.0	0.59	2.05
3715882.	388952.	955771.	1.297	0.674	0.5473	22.934	0.4830	0.3946	0.00601	1.16	0.642	82.5	0.64	1.95
3890226.	428127.	927276.	1.169	0.674	0.4385	21.620	0.4685	0.3944	0.00556	1.16	0.641	83.7	0.66	1.95
HEAT BALANCE, -0.02 TEST VOLTAGE, 18.0 HEAT INPUT/UNIT AREA, 0.674 ID, 0.335 OD, 0.375 LENGTH, 24.0														
679203.	292739.	1718463.	1.212	0.594	13.0700	5.178	0.2816	0.3231	0.00928	0.51	0.710	59.0	0.44	1.78
768361.	201130.	1371493.	1.235	0.627	7.8135	8.871	0.3068	0.3360	0.00990	0.55	0.668	52.8	0.41	1.75
881314.	129711.	975865.	1.276	0.666	4.5775	16.674	0.3378	0.3808	0.01021	0.62	0.638	45.9	0.38	1.83
1025032.	103336.	727503.	1.338	0.678	2.8727	25.589	0.3755	0.4061	0.00999	0.67	0.614	42.7	0.39	1.97
1107582.	103156.	666783.	1.374	0.680	2.3691	27.713	0.3958	0.4097	0.00973	0.68	0.607	42.6	0.40	2.01
1194247.	111158.	645583.	1.408	0.679	2.0184	27.497	0.4156	0.4071	0.00937	0.67	0.603	43.5	0.42	2.00
1282896.	119147.	624008.	1.439	0.678	1.7294	27.354	0.4341	0.4048	0.00902	0.67	0.600	44.3	0.44	1.99
1460318.	146118.	620123.	1.520	0.674	1.3239	24.650	0.4697	0.3948	0.00829	0.64	0.600	46.9	0.49	1.92
1629651.	175156.	613991.	1.570	0.671	1.0244	22.130	0.4954	0.3877	0.00754	0.63	0.604	49.0	0.54	1.87
1778999.	203101.	601912.	1.454	0.668	0.8020	20.517	0.4937	0.3836	0.00705	0.62	0.608	50.5	0.58	1.84
1902160.	250042.	634973.	1.345	0.662	0.6574	17.330	0.4872	0.3738	0.00652	0.60	0.621	53.3	0.63	1.75
1999533.	290020.	647071.	1.230	0.658	0.5379	15.421	0.4760	0.3678	0.00604	0.59	0.630	55.1	0.67	1.71
HEAT BALANCE, 0.03 TEST VOLTAGE, 17.5 HEAT INPUT/UNIT AREA, 0.620 ID, 0.335 OD, 0.375 LENGTH, 24.0														
787354.	784458.	2715865.	1.208	0.674	26.3986	2.158	0.2585	0.3782	0.00586	0.52	0.991	88.8	0.51	1.86
864430.	526821.	2444953.	1.204	0.593	15.7524	3.549	0.2745	0.3370	0.00675	0.59	0.763	79.5	0.44	1.81
952264.	401855.	2143086.	1.212	0.594	10.3244	5.228	0.2930	0.3296	0.00721	0.58	0.623	73.7	0.41	1.77
1054173.	324773.	1854488.	1.230	0.613	7.0331	7.316	0.3140	0.3370	0.00742	0.61	0.593	69.4	0.39	1.74
1111185.	296698.	1717550.	1.241	0.624	5.8643	8.529	0.3255	0.3437	0.00746	0.62	0.585	67.5	0.39	1.74
1172041.	299051.	1667846.	1.254	0.625	5.0836	8.885	0.3375	0.3446	0.00738	0.62	0.581	68.0	0.40	1.72
1237871.	238274.	1405721.	1.268	0.648	4.0568	12.186	0.3501	0.3656	0.00748	0.65	0.565	63.0	0.38	1.77
1387491.	196506.	1122203.	1.301	0.665	2.8297	17.071	0.3773	0.3884	0.00736	0.70	0.547	59.0	0.37	1.85
1556682.	182113.	941525.	1.331	0.671	2.0634	21.284	0.4047	0.3997	0.00709	0.73	0.534	57.3	0.39	1.93
1735115.	202128.	896660.	1.350	0.670	1.6218	20.951	0.4291	0.3967	0.00670	0.72	0.530	59.0	0.41	1.92
1908441.	267760.	992053.	1.380	0.659	1.3437	16.466	0.4512	0.3802	0.00628	0.68	0.542	64.4	0.47	1.80
2070206.	318775.	1023587.	1.403	0.651	1.1569	14.620	0.4685	0.3694	0.00592	0.66	0.551	67.7	0.52	1.73
HEAT BALANCE, -0.07 TEST VOLTAGE, 45.8 HEAT INPUT/UNIT AREA, 2.232 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1108650.	127119.	952950.	1.167	0.668	4.5228	23.197	0.3509	0.4261	0.01263	2.02	1.113	48.0	0.57	2.17
1458613.	102104.	564903.	1.136	0.692	1.8343	38.299	0.3561	0.4082	0.01189	2.22	1.054	45.7	0.65	2.47
1865494.	97091.	365314.	1.056	0.686	0.8999	51.892	0.3938	0.4074	0.01065	2.16	0.943	46.7	0.76	2.79
2213643.	144494.	373137.	0.984	0.693	0.5732	39.857	0.4107	0.4084	0.00989	2.19	0.949	50.9	0.87	2.68
2343297.	136843.	310030.	0.924	0.688	0.4340	44.988	0.4081	0.4077	0.00849	2.28	0.925	49.4	0.90	2.84
2442680.	158357.	315136.	0.871	0.690	0.3577	39.956	0.4032							

TABLE IV. - Continued. UNIFORMLY

(c) Continued. Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	Pd	Tb	RUB	VELUC	M	X2	TO	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	ROFM
RUN 60- 710 WEIGHT FLOW, 0.1765 HEAT INPUT, 54.60 INLET BULK TEMP, 48.0 OUTLET BULK TEMP, 134.6 PLOT CH D															
2.50	736.9	58.9	3.942	73.2	0.021	0.0273	852.	760.	0.00311	1.45	1.38	1.97	12.91	0.037	3.07
4.50	736.2	66.4	3.560	81.0	0.027	0.0669	1000.	903.	0.00282	1.24	1.11	1.93	13.60	0.022	2.04
6.50	735.4	73.0	3.161	91.2	0.034	0.1288	1000.	703.	0.00284	1.10	0.95	1.78	12.37	0.014	1.39
8.50	734.4	78.9	2.781	103.7	0.042	0.2078	972.	876.	0.00292	0.99	0.85	1.62	11.11	0.007	1.02
9.50	733.3	81.6	2.604	110.7	0.046	0.2520	940.	846.	0.00299	0.96	0.82	1.54	10.36	0.004	0.90
10.50	733.4	84.3	2.439	118.2	0.051	0.2987	902.	809.	0.00309	0.94	0.80	1.47	9.60	0.000	0.81
11.50	732.8	86.9	2.286	126.1	0.055	0.3465	858.	766.	0.00322	0.93	0.80	1.39	8.81	-0.004	0.75
13.50	731.6	92.1	2.020	142.7	0.064	0.4387	781.	691.	0.00350	0.89	0.80	1.25	7.50	-0.013	0.67
15.50	730.5	97.5	1.800	160.2	0.071	0.5240	745.	655.	0.00368	0.86	0.81	1.16	6.71	-0.024	0.60
17.50	729.5	103.1	1.616	178.4	0.078	0.5997	709.	619.	0.00390	0.84	0.83	1.08	6.00	-0.036	0.55
19.50	728.2	109.0	1.465	196.8	0.085	0.6630	667.	577.	0.00418	0.84	0.85	1.03	5.29	-0.053	0.53
21.50	726.6	115.0	1.340	215.1	0.091	0.7136	674.	564.	0.00419	0.81	0.85	0.98	5.08	-0.066	0.49
RUN 64- 706 WEIGHT FLOW, 0.1660 HEAT INPUT, 33.60 INLET BULK TEMP, 48.2 OUTLET BULK TEMP, 106.3 PLOT CH S															
2.50	724.3	54.7	4.118	65.9	0.018	0.0149	502.	442.	0.00304	1.26	1.18	1.43	8.09	0.076	3.77
4.50	723.9	59.7	3.891	69.7	0.021	0.0317	736.	674.	0.00227	1.04	0.96	1.35	11.28	0.040	3.01
6.50	723.4	64.9	3.629	74.7	0.024	0.0582	880.	816.	0.00203	0.95	0.83	1.39	12.59	0.026	2.26
8.50	722.9	69.6	3.351	80.9	0.029	0.0960	887.	824.	0.00203	0.87	0.73	1.32	11.83	0.019	1.74
9.50	722.6	71.8	3.215	84.4	0.031	0.1184	843.	779.	0.00211	0.85	0.69	1.27	10.86	0.017	1.58
10.50	722.3	73.8	3.084	87.9	0.033	0.1422	786.	724.	0.00221	0.83	0.67	1.20	9.81	0.016	1.47
11.50	722.0	75.7	2.959	91.6	0.036	0.1670	735.	673.	0.00233	0.82	0.65	1.15	8.89	0.014	1.38
13.50	721.4	79.2	2.728	99.4	0.041	0.2186	660.	598.	0.00255	0.81	0.63	1.07	7.56	0.009	1.24
15.50	720.7	82.5	2.518	107.7	0.046	0.2733	606.	545.	0.00275	0.80	0.61	1.04	6.61	0.003	1.12
17.50	720.0	85.6	2.326	116.6	0.051	0.3308	582.	521.	0.00287	0.78	0.60	0.99	6.09	-0.004	1.01
19.50	719.2	88.7	2.153	126.0	0.056	0.3831	543.	483.	0.00308	0.77	0.61	0.95	5.45	-0.012	0.94
21.50	718.4	91.8	1.998	135.8	0.061	0.4437	541.	481.	0.00312	0.75	0.61	0.91	5.24	-0.021	0.85
RUN 66- 661 WEIGHT FLOW, 0.0813 HEAT INPUT, 30.02 INLET BULK TEMP, 51.1 OUTLET BULK TEMP, 150.2 PLOT CH U															
2.50	830.8	62.3	3.866	34.4	0.010	0.0311	517.	464.	0.00264	1.68	1.56	1.93	7.44	0.066	3.32
4.50	830.6	70.1	3.478	38.2	0.013	0.0786	647.	593.	0.00220	1.41	1.22	1.77	8.47	0.036	2.34
6.50	830.5	77.5	3.056	43.5	0.016	0.1545	852.	797.	0.00180	1.17	1.00	1.69	10.29	0.016	1.43
8.50	830.3	84.8	2.644	50.2	0.020	0.2528	841.	787.	0.00184	1.05	0.91	1.53	9.27	0.006	1.03
9.50	830.2	88.3	2.457	54.1	0.022	0.3068	797.	733.	0.00194	1.02	0.89	1.43	8.30	0.001	0.93
10.50	830.0	91.8	2.286	58.1	0.024	0.3623	754.	703.	0.00195	0.97	0.87	1.36	7.96	-0.005	0.82
11.50	829.8	95.2	2.130	62.4	0.026	0.4168	757.	730.	0.00202	0.94	0.87	1.29	7.38	-0.011	0.75
13.50	829.5	102.4	1.863	71.3	0.030	0.5175	712.	658.	0.00216	0.91	0.88	1.18	6.42	-0.025	0.66
15.50	829.2	109.7	1.649	80.5	0.034	0.6026	668.	614.	0.00231	0.88	0.90	1.10	5.59	-0.042	0.61
17.50	828.9	117.5	1.480	89.8	0.037	0.6680	665.	611.	0.00236	0.85	0.89	1.03	5.20	-0.058	0.55
19.50	828.6	125.6	1.340	99.1	0.040	0.9911	639.	585.	0.00249	0.84	0.90	0.99	4.66	-0.080	0.42
21.50	828.3	134.0	1.224	108.5	0.043	0.9999	646.	593.	0.00251	0.81	0.88	0.94	4.42	-0.099	0.41
RUN 68- 660 WEIGHT FLOW, 0.1103 HEAT INPUT, 30.62 INLET BULK TEMP, 52.2 OUTLET BULK TEMP, 117.0 PLOT CH W															
2.50	619.4	60.3	3.759	47.9	0.015	0.0422	534.	478.	0.00269	1.60	1.23	1.95	7.93	0.046	2.90
4.50	619.1	66.0	3.418	52.7	0.019	0.0796	705.	648.	0.00214	1.28	0.97	1.79	9.83	0.023	2.00
6.50	618.8	71.2	3.044	59.2	0.024	0.1371	836.	779.	0.00190	1.07	0.82	1.71	10.94	0.012	1.31
8.50	618.4	76.1	2.672	67.4	0.029	0.2125	814.	757.	0.00195	0.97	0.74	1.55	9.95	0.005	0.98
9.50	618.1	78.3	2.498	72.1	0.033	0.2557	789.	733.	0.00200	0.93	0.72	1.46	9.36	0.002	0.87
10.50	617.9	80.5	2.335	77.2	0.036	0.3014	748.	691.	0.00209	0.91	0.71	1.38	8.59	-0.002	0.80
11.50	617.7	82.6	2.186	82.4	0.039	0.3472	697.	641.	0.00223	0.91	0.72	1.31	7.75	-0.006	0.75
13.50	617.2	87.0	1.928	93.5	0.045	0.4264	637.	581.	0.00242	0.90	0.73	1.22	6.68	-0.015	0.67
15.50	616.7	91.5	1.714	105.1	0.050	0.5200	585.	528.	0.00265	0.90	0.76	1.15	5.78	-0.028	0.62
17.50	616.1	96.3	1.536	117.3	0.055	0.5951	577.	521.	0.00272	0.86	0.78	1.08	5.41	-0.040	0.56
19.50	615.7	101.5	1.388	129.8	0.060	0.6600	546.	490.	0.00291	0.85	0.81	1.03	4.83	-0.057	0.53
21.50	615.1	107.1	1.263	142.7	0.064	0.7148	551.	495.	0.00292	0.82	0.82	0.97	4.62	-0.072	0.49
RUN 75- 666 WEIGHT FLOW, 0.1828 HEAT INPUT, 26.32 INLET BULK TEMP, 46.9 OUTLET BULK TEMP, 84.3 PLOT CH 4															
2.50	729.4	51.8	4.239	70.5	0.019	0.0074	254.	189.	0.00687	1.71	1.67	1.76	3.66	0.236	4.18
4.50	729.2	55.5	4.087	73.1	0.021	0.0169	281.	217.	0.00597	1.66	1.42	1.73	3.91	0.178	3.94
6.50	728.8	59.0	3.930	76.0	0.022	0.0284	314.	252.	0.00512	1.54	1.20	1.63	4.28	0.131	3.65
8.50	728.5	62.3	3.768	79.3	0.025	0.0431	340.	280.	0.00464	1.42	1.05	1.53	4.49	0.101	3.34
9.50	728.2	63.9	3.605	81.0	0.026	0.0518	341.	282.	0.00465	1.41	1.00	1.51	4.40	0.093	3.20
10.50	728.0	65.5	3.401	82.9	0.027	0.0616	367.	309.	0.00423	1.30	0.92	1.42	4.73	0.077	3.00
11.50	727.7	67.0	3.216	84.7	0.029	0.0725	369.	311.	0.00422	1.28	0.89	1.40	4.65	0.071	2.85
13.50	727.3	69.8	3.044	89.3	0.032	0.0973	398.	342.	0.00388	1.15	0.79	1.29	4.89	0.053	2.50
15.50	726.7	72.6	3.170	94.2	0.035	0.1265	421.	365.	0.00366	1.06	0.72	1.20	5.03	0.040	2.19
17.50	726.2	75.3	2.995	99.7	0.039	0.1601	475.	421.	0.00322	0.92	0.65	1.09	5.59	0.026	1.83
19.50	725.6	77.9	2.820	105.9	0.043	0.1776	495.	440.	0.00311	0.85	0.61	1.03	5.65	0.017	1.58
21.50	725.1	80.6	2.649	112.7	0.047	0.2389	521.	465.	0.00297	0.79	0.58	0.96	5.78	0.009	1.36
RUN 77- 635 WEIGHT FLOW, 0.1088 HEAT INPUT, 19.39 INLET BULK TEMP, 46.2 OUTLET BULK TEMP, 92.7 PLOT CH 6															
2.50	811.2	52.5	4.261	41.7	0.011	0.0023	283.	236.	0.00387	1.63	1.61	1.70	4.49	0.193	4.24
4.50	811.2	57.2	4.074	43.6	0.012	0.0149	304.	257.	0.00360	1.56	1.39	1.64	4.50	0.154	3.92
6.50	811.1	61.5	3.884	45.8	0.014	0.0303	335.	290.	0.00323	1.43	1.19	1.53	4.72	0.115	3.56
8.50	811.0	65.6	3.687	48.2	0.015	0.0509	360.	317.	0.00299	1.32	1.03	1.43	4.84	0.089	3.18
9.50	811.0	67.6	3.588	49.5	0.016	0.0634	363.	321.	0.00298	1.29	0.99	1.40	4.75	0.080	3.00
10.50	810.9	69.4	3.487	51.0	0.017	0.0775	381.	339.	0.00283	1.22	0.92	1.34	4.88	0.069	2.79
11.50	810.8	71.3	3.386	52.5	0.018	0.0931	393.	352.	0.00275	1.16	0.87	1.29	4.94	0.059	2.60
13.50	810.6	74.8	3.182	55.9	0.020	0.1288	420.	380.	0.00258	1.06	0.79	1.20	5.08	0.043	2.22
15.50	810.4	78.2	2.980	59.6	0.022	0.1699	443.	403.	0.00246	0.98	0.73	1.12	5.15	0.030	1.90
17.50	810.2	81.6	2.783	63.9	0.025	0.2135	482.	442.	0.00227	0.87	0.67	1.03	5.41	0.018	1.59
19.50	810.1	84.9	2.592	68.6	0.028	0.2653	484.	443.	0.00229	0.83	0.65	0.98	5.22	0.008	1.39
21.50	809.9	88.3	2.411	73.7	0.031	0.3170	491.	450.	0.00228	0.79	0.63	0.93	5.10	-0.001	1.22

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DWDL	H/H-II	SIMPLE	NU/NUT	TOLK
HEAT BALANCE,-0.12 TEST VOLTAGE, 46.0 HEAT INPUT/UNIT AREA, 2.241 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1218021.	132622.	1249761.	1.175	0.677	7.3241	24.940	0.2790	0.4179	0.01057	2.18	0.981	52.9	0.43	2.13
1546581.	110586.	814821.	1.151	0.688	2.9176	38.141	0.3222	0.4081	0.01023	2.36	0.929	51.5	0.48	2.41
1942628.	123029.	624644.	1.109	0.688	1.5435	42.587	0.3632	0.4080	0.00926	2.36	0.874	54.0	0.56	2.59
2345322.	144745.	525848.	1.037	0.689	0.9504	43.068	0.3901	0.4081	0.00822	2.32	0.833	57.0	0.64	2.68
2528730.	162148.	507344.	1.011	0.691	0.7795	41.011	0.3994	0.4084	0.00769	2.29	0.817	59.0	0.68	2.68
2692625.	183872.	501577.	0.985	0.693	0.6508	38.034	0.4055	0.4088	0.00717	2.24	0.805	61.3	0.71	2.66
2832852.	211913.	510895.	0.947	0.691	0.5542	34.254	0.4063	0.4116	0.00671	2.19	0.785	64.0	0.74	2.63
3038657.	277755.	548307.	0.866	0.666	0.4195	27.387	0.4008	0.4240	0.00595	2.10	0.759	69.4	0.77	2.64
3161205.	332665.	565367.	0.797	0.666	0.3242	23.229	0.3919	0.4258	0.00534	2.05	0.744	73.3	0.79	2.62
3220887.	395742.	598803.	0.733	0.667	0.2598	19.375	0.3811	0.4277	0.00482	2.01	0.733	77.6	0.81	2.59
3235097.	474238.	656529.	0.683	0.666	0.2175	15.716	0.3713	0.4269	0.00440	1.96	0.728	82.6	0.83	2.53
3219459.	501056.	652330.	0.649	0.666	0.1816	14.650	0.3660	0.4272	0.00407	1.97	0.708	84.3	0.82	2.57
HEAT BALANCE,-0.21 TEST VOLTAGE, 32.9 HEAT INPUT/UNIT AREA, 1.439 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1018277.	267878.	1909510.	1.200	0.653	16.6577	9.566	0.2598	0.4143	0.00717	1.18	0.747	63.6	0.34	1.94
1184462.	149369.	1263172.	1.173	0.667	6.7470	21.204	0.2847	0.4268	0.00738	1.39	0.687	53.9	0.32	2.11
1396278.	117349.	887694.	1.158	0.694	3.4759	32.099	0.3147	0.4090	0.00735	1.53	0.668	51.0	0.34	2.29
1646042.	124203.	73243.	1.138	0.693	2.1455	35.487	0.3453	0.4087	0.00671	1.53	0.641	52.6	0.38	2.42
1777245.	140355.	719706.	1.123	0.690	1.7952	33.538	0.3590	0.4117	0.00657	1.49	0.620	54.9	0.40	2.42
1906661.	164009.	735213.	1.103	0.669	1.5484	30.512	0.3707	0.4221	0.00624	1.44	0.602	57.8	0.41	2.43
2031572.	189822.	752385.	1.080	0.667	1.3609	27.621	0.3802	0.4258	0.00592	1.39	0.595	60.7	0.43	2.41
2263343.	241922.	779463.	1.037	0.666	1.0783	23.382	0.3944	0.4265	0.00543	1.32	0.586	65.8	0.47	2.35
2466798.	296932.	804560.	1.009	0.665	0.8731	20.171	0.4047	0.4254	0.00504	1.27	0.582	70.3	0.51	2.30
2639794.	339570.	798061.	0.968	0.664	0.7046	18.515	0.4083	0.4250	0.00470	1.25	0.578	73.3	0.54	2.29
2778501.	404091.	835616.	0.915	0.662	0.5904	15.916	0.4059	0.4247	0.00439	1.21	0.580	77.5	0.57	2.24
2884745.	433747.	812381.	0.868	0.662	0.4869	15.239	0.4018	0.4246	0.00413	1.21	0.573	79.0	0.58	2.26
HEAT BALANCE,-0.04 TEST VOLTAGE, 33.4 HEAT INPUT/UNIT AREA, 1.248 ID, 0.335 OD, 0.375 LENGTH, 24.0														
586381.	143762.	840033.	1.159	0.652	8.8768	9.982	0.2871	0.4261	0.01104	1.06	1.072	37.5	0.56	1.97
742500.	109505.	570437.	1.117	0.661	3.2912	17.112	0.3288	0.4298	0.01039	1.15	0.962	35.1	0.57	2.16
934460.	78752.	327375.	1.045	0.693	1.4556	30.956	0.3659	0.4103	0.00978	1.30	0.904	31.9	0.62	2.47
1125743.	91614.	272778.	0.958	0.694	0.8614	31.545	0.3881	0.4104	0.00862	1.29	0.858	33.6	0.71	2.57
1205712.	109061.	278362.	0.927	0.676	0.7089	27.925	0.3943	0.4193	0.00802	1.25	0.829	35.5	0.74	2.59
1272150.	116987.	263528.	0.887	0.677	0.5750	27.258	0.3951	0.4191	0.00753	1.25	0.813	36.2	0.77	2.62
1324504.	131976.	265502.	0.843	0.666	0.4837	24.832	0.3925	0.4245	0.00705	1.23	0.797	37.6	0.79	2.64
1390728.	163500.	274941.	0.771	0.663	0.3592	20.416	0.3843	0.4280	0.00620	1.20	0.777	40.3	0.82	2.63
1417532.	199891.	295126.	0.709	0.663	0.2838	16.441	0.3749	0.4305	0.00551	1.17	0.763	43.2	0.84	2.60
1418449.	220252.	298392.	0.665	0.663	0.2320	14.657	0.3693	0.4302	0.00500	1.16	0.740	44.8	0.85	2.63
1403431.	253477.	255190.	0.635	0.662	0.0068	12.205	0.3653	0.4306	0.00456	1.15	0.729	47.4	0.98	2.71
1378750.	267488.	267510.	0.616	0.663	0.0001	11.195	0.3627	0.4303	0.00419	1.15	0.706	48.6	0.94	2.74
HEAT BALANCE,-0.02 TEST VOLTAGE, 33.4 HEAT INPUT/UNIT AREA, 1.279 ID, 0.335 OD, 0.375 LENGTH, 24.0														
861435.	148091.	1025110.	1.184	0.666	5.7312	14.787	0.3010	0.4196	0.01090	1.12	0.904	46.3	0.47	1.98
1061667.	102159.	648565.	1.185	0.671	2.6937	27.497	0.3422	0.4243	0.01042	1.25	0.821	41.6	0.48	2.24
1310758.	85143.	421443.	1.164	0.691	1.4346	41.087	0.3826	0.4105	0.00981	1.34	0.783	39.4	0.54	2.47
1571189.	100540.	364070.	1.118	0.685	0.9140	41.250	0.4110	0.4133	0.00874	1.33	0.752	41.3	0.61	2.55
1690684.	112805.	353677.	1.103	0.677	0.7522	39.315	0.4213	0.4170	0.00821	1.31	0.738	42.6	0.63	2.57
1797209.	131360.	359663.	1.068	0.670	0.6351	35.467	0.4251	0.4216	0.00767	1.28	0.732	44.5	0.66	2.56
1887108.	156134.	378501.	1.016	0.671	0.5501	30.717	0.4233	0.4243	0.00716	1.24	0.730	46.8	0.69	2.51
2019707.	201648.	402716.	0.924	0.671	0.4173	24.665	0.4155	0.4227	0.00640	1.20	0.728	50.5	0.74	2.43
2100300.	256431.	446129.	0.837	0.670	0.3291	19.484	0.4034	0.4213	0.00577	1.16	0.730	54.3	0.77	2.35
2140833.	287662.	441339.	0.758	0.670	0.2569	17.415	0.3896	0.4212	0.00525	1.15	0.718	56.1	0.79	2.36
2151339.	341634.	470726.	0.698	0.669	0.2113	14.277	0.3768	0.4205	0.00480	1.13	0.718	59.4	0.81	2.32
2140893.	363945.	477034.	0.654	0.669	0.1723	13.175	0.3657	0.4208	0.00441	1.14	0.699	60.7	0.80	2.34
HEAT BALANCE,-0.02 TEST VOLTAGE, 28.5 HEAT INPUT/UNIT AREA, 1.031 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1027979.	974741.	3254771.	1.225	0.630	50.4183	2.236	0.2469	0.3625	0.00545	0.94	0.953	102.2	0.51	1.92
1145970.	817342.	3050325.	1.194	0.601	21.7190	2.985	0.2632	0.3568	0.00587	0.97	0.823	98.8	0.48	1.88
1271899.	677447.	2769435.	1.175	0.599	12.4054	4.051	0.2803	0.3605	0.00577	0.99	0.737	94.5	0.46	1.85
1410429.	601355.	2515393.	1.165	0.608	7.9686	5.101	0.2988	0.3684	0.00574	1.01	0.693	92.2	0.45	1.84
1484928.	605785.	2453698.	1.161	0.609	6.6790	5.297	0.3082	0.3692	0.00569	1.01	0.685	93.1	0.46	1.82
1563229.	540549.	2250700.	1.156	0.619	5.4040	6.354	0.3178	0.3784	0.00565	1.03	0.658	89.9	0.44	1.83
1645289.	545144.	2183397.	1.150	0.620	4.6132	6.597	0.3273	0.3776	0.00557	1.03	0.652	90.6	0.45	1.83
1819038.	497864.	1921952.	1.136	0.632	3.3057	8.087	0.3459	0.3916	0.00540	1.05	0.623	88.4	0.45	1.85
2003841.	473785.	1709934.	1.115	0.640	2.4622	9.418	0.3629	0.4004	0.00520	1.07	0.601	87.1	0.46	1.89
2196200.	407796.	1403084.	1.085	0.653	1.8023	12.450	0.3773	0.4141	0.00495	1.11	0.567	82.7	0.44	2.00
2389778.	402758.	1257215.	1.050	0.656	1.4068	13.929	0.3887	0.4195	0.00472	1.13	0.552	82.2	0.45	2.06
2576131.	393047.	1115107.	1.023	0.660	1.1078	15.374	0.3982	0.4249	0.00448	1.14	0.536	81.3	0.46	2.14
HEAT BALANCE,-0.01 TEST VOLTAGE, 24.5 HEAT INPUT/UNIT AREA, 0.764 ID, 0.335 OD, 0.375 LENGTH, 24.0														
600032.	461350.	1794581.	1.230	0.602135	5243	2.831	0.2451	0.3674	0.00651	0.71	0.893	60.9	0.46	1.94
685334.	417795.	1673205.	1.188	0.602	23.4222	3.547	0.2647	0.3661	0.00652	0.72	0.821	60.8	0.47	1.90
776518.	363161.	1504946.	1.163	0.610	11.4197	4.658	0.2852	0.3759	0.00650	0.74	0.758	59.4	0.46	1.87
877954.	332530.	1356431.	1.145	0.619	6.7237	5.773	0.3059	0.3861	0.00645	0.75	0.716	58.7	0.46	1.86
932612.	333955.	1302780.	1.135	0.621	5.4313	6.073	0.3177	0.3880	0.00625	0.75	0.705	59.2	0.48	1.86
989873.	315958.	1215427.	1.124	0.628	4.3612	6.859	0.3283	0.3952	0.00615	0.76	0.684	58.4	0.47	1.87
1049579.	307077.	1141615.	1.111	0.632	3.5830	7.503	0.3386	0.4004	0.00603	0.77	0.669	58.1	0.48	1.89
1174260.	290520.	997507.	1.079	0.640	2.5000	8.935	0.3573	0.4086	0.00576	0.77	0.640	57.3	0.48	1.93
1301777.	282694.	880031.	1.037	0.645	1.8262	10.245	0.3722	0.4147	0.00547	0.80	0.617	56.9	0.50	1.99
1426724.	263715.	749864.	0.993	0.653	1.3509	12.350	0.3833	0.4246	0.00516	0.82	0.590	55.4	0.49	2.09
1542987.	278671.	702393.	0.961	0.654	1.0644	12.522	0.3920	0.4258	0.00488	0.82	0.580	56.5	0.51	2.13
1645987.	290517.	654962.	0.929	0.655	0.8451	12.737	0.3971	0.4281	0.00460	0.82	0.570	57.1	0.53	2.17

TABLE IV. - Continued. UNIFORMLY

(c) Continued. Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HK	H/HM	H/HF	TW/TB	THETA	ROFM
RUN 79- 687 WEIGHT FLOW, 0.1418 HEAT INPUT, 17.70 INLET BULK TEMP, 47.6 OUTLET BULK TEMP, 76.2 PLOT CH 8															
2.50	515.2	51.5	4.102	56.5	0.016	0.0164	231.	184.	0.00468	1.87	1.31	1.96	3.57	0.176	3.95
4.50	515.0	54.5	3.961	58.5	0.018	0.0241	274.	228.	0.00369	1.74	1.06	1.87	4.19	0.117	3.67
6.50	514.8	57.2	3.813	60.8	0.019	0.0339	308.	264.	0.00319	1.58	0.90	1.72	4.61	0.085	3.36
8.50	514.5	59.9	3.657	63.3	0.021	0.0463	351.	310.	0.00273	1.37	0.77	1.55	5.17	0.060	3.00
9.50	514.3	61.1	3.576	64.8	0.023	0.0537	371.	331.	0.00257	1.28	0.72	1.47	5.42	0.051	2.81
10.50	514.2	62.3	3.492	66.3	0.024	0.0621	406.	368.	0.00233	1.15	0.66	1.36	5.90	0.041	2.59
11.50	514.1	63.5	3.406	68.0	0.025	0.0714	430.	391.	0.00221	1.08	0.62	1.30	6.16	0.034	2.39
13.50	513.7	65.8	3.228	71.8	0.028	0.0934	484.	445.	0.00198	0.93	0.55	1.19	6.76	0.024	2.00
15.50	513.4	67.9	3.045	76.1	0.032	0.1196	491.	452.	0.00195	0.87	0.51	1.13	6.65	0.018	1.74
17.50	513.0	69.9	2.864	80.9	0.035	0.1495	482.	443.	0.00201	0.85	0.48	1.10	6.34	0.013	1.54
19.50	512.6	71.7	2.690	86.1	0.040	0.1826	431.	373.	0.00226	0.90	0.48	1.12	5.47	0.009	1.46
21.50	512.2	73.4	2.523	91.8	0.044	0.2186	412.	374.	0.00238	0.89	0.47	1.10	5.09	0.004	1.34
RUN 80- 889 WEIGHT FLOW, 0.1080 HEAT INPUT, 48.30 INLET BULK TEMP, 78.7 OUTLET BULK TEMP, 204.4 PLOT CH 9															
2.50	732.3	88.4	2.202	80.1	0.035	0.3745	964.	878.	0.00254	1.08	0.99	1.75	9.93	-0.095	0.64
4.50	731.8	97.3	1.810	97.5	0.043	0.5201	1219.	1122.	0.00221	0.85	0.97	1.55	11.53	-0.013	0.39
6.50	731.1	107.6	1.504	117.3	0.051	0.6473	1093.	1002.	0.00239	0.85	0.96	1.36	9.31	-0.026	0.35
8.50	730.5	117.1	1.311	134.6	0.057	0.7257	811.	530.	0.00395	1.07	1.12	1.26	4.53	-0.079	0.52
9.50	730.0	121.9	1.235	142.9	0.060	0.7547	920.	836.	0.00274	0.88	0.98	1.19	6.86	-0.053	0.35
10.50	729.6	126.9	1.164	151.6	0.062	0.7765	698.	617.	0.00352	0.96	1.05	1.14	4.86	-0.087	0.36
11.50	729.2	132.0	1.102	160.1	0.065	0.9999	863.	780.	0.00293	0.87	0.98	1.11	5.91	-0.074	0.29
13.50	728.2	143.0	0.991	178.0	0.070	0.9999	818.	736.	0.00312	0.87	0.97	1.06	5.15	-0.099	0.30
15.50	727.2	153.3	0.907	194.4	0.075	0.9999	815.	732.	0.00319	0.85	0.94	1.01	4.78	-0.119	0.30
17.50	726.2	163.7	0.838	210.6	0.080	0.9999	802.	720.	0.00330	0.84	0.92	0.98	4.40	-0.143	0.30
19.50	725.2	173.9	0.780	226.2	0.084	0.9999	695.	617.	0.00389	0.87	0.95	0.97	3.55	-0.202	0.33
21.50	724.3	183.7	0.732	241.0	0.088	0.9999	779.	697.	0.00352	0.83	0.88	0.94	3.79	-0.194	0.30
RUN 81- 891 WEIGHT FLOW, 0.0920 HEAT INPUT, 46.70 INLET BULK TEMP, 69.6 OUTLET BULK TEMP, 220.9 PLOT CH 8															
2.50	331.3	75.7	1.257	119.6	0.071	0.5369	613.	537.	0.00345	1.48	1.19	2.23	7.10	-0.020	0.35
4.50	330.1	84.5	0.951	158.1	0.087	0.6959	1128.	1042.	0.00219	0.86	1.19	1.86	12.33	-0.019	0.15
6.50	328.8	96.8	0.741	202.8	0.103	0.8128	938.	859.	0.00251	0.94	1.27	1.54	8.88	-0.040	0.15
8.50	327.4	109.9	0.613	245.2	0.115	0.8797	804.	728.	0.00288	0.99	1.33	1.36	6.62	-0.070	0.16
9.50	326.6	116.3	0.567	265.2	0.122	0.9016	831.	754.	0.00283	0.96	1.30	1.31	6.48	-0.078	0.15
10.50	325.9	122.9	0.527	285.1	0.128	0.9192	789.	713.	0.00299	0.97	1.30	1.26	5.80	-0.096	0.16
11.50	325.2	129.6	0.493	305.1	0.133	0.9334	840.	763.	0.00287	0.94	1.26	1.21	5.89	-0.100	0.14
13.50	323.5	143.7	0.434	346.1	0.145	0.9541	865.	788.	0.00286	0.90	1.20	1.14	5.49	-0.120	0.13
15.50	322.0	156.9	0.391	384.4	0.156	0.9939	911.	833.	0.00279	0.86	1.12	1.08	5.31	-0.134	0.12
17.50	320.5	170.5	0.355	423.1	0.166	0.9999	928.	850.	0.00280	0.84	1.05	1.03	4.99	-0.153	0.12
19.50	318.7	183.3	0.327	460.1	0.175	0.9999	803.	727.	0.00327	0.90	1.05	1.03	3.97	-0.216	0.13
21.50	316.9	195.3	0.304	494.9	0.185	0.9999	908.	830.	0.00297	0.83	0.95	0.97	4.25	-0.203	0.11
RUN 83- 892 WEIGHT FLOW, 0.1030 HEAT INPUT, 47.30 INLET BULK TEMP, 69.0 OUTLET BULK TEMP, 207.2 PLOT CH 8															
2.50	314.4	74.5	1.222	137.7	0.083	0.5375	606.	528.	0.00360	1.41	1.13	2.14	7.10	-0.019	0.34
4.50	313.0	82.2	0.940	179.0	0.101	0.6863	1081.	994.	0.00232	0.84	1.13	1.80	12.39	-0.018	0.15
6.50	311.6	93.1	0.741	227.0	0.118	0.7995	918.	837.	0.00262	0.91	1.21	1.50	8.99	-0.037	0.15
8.50	310.2	104.9	0.616	273.1	0.132	0.8679	811.	732.	0.00294	0.94	1.27	1.33	6.97	-0.063	0.16
9.50	309.5	110.9	0.570	295.3	0.139	0.8912	802.	724.	0.00299	0.93	1.27	1.27	6.53	-0.074	0.15
10.50	308.6	116.9	0.530	317.2	0.145	0.9097	817.	738.	0.00298	0.91	1.25	1.23	6.31	-0.083	0.15
11.50	307.8	123.0	0.496	339.1	0.152	0.9249	805.	726.	0.00304	0.91	1.23	1.18	5.90	-0.095	0.14
13.50	306.3	135.5	0.439	383.0	0.165	0.9474	819.	740.	0.00306	0.88	1.19	1.11	5.46	-0.116	0.14
15.50	304.5	148.1	0.394	426.7	0.177	0.9939	855.	775.	0.00301	0.85	1.13	1.05	5.23	-0.132	0.12
17.50	302.6	160.2	0.359	468.7	0.189	0.9999	868.	788.	0.00302	0.83	1.06	1.01	4.92	-0.151	0.12
19.50	300.6	172.5	0.329	511.5	0.201	0.9999	926.	846.	0.00291	0.79	0.99	0.96	4.90	-0.159	0.11
21.50	298.6	184.4	0.304	553.1	0.212	0.9999	854.	774.	0.00320	0.82	0.97	0.95	4.20	-0.202	0.12
RUN 84- 368 WEIGHT FLOW, 0.1210 HEAT INPUT, 38.60 INLET BULK TEMP, 63.2 OUTLET BULK TEMP, 137.9 PLOT CH C															
2.50	222.0	68.5	0.912	216.7	0.143	0.5972	1150.	1061.	0.00195	0.58	0.87	1.78	15.61	-0.007	0.12
4.50	220.4	75.1	0.715	276.4	0.168	0.7238	826.	756.	0.00242	0.75	0.97	1.41	10.06	-0.020	0.13
6.50	218.5	82.4	0.595	332.1	0.189	0.8038	703.	634.	0.00277	0.80	1.08	1.23	7.68	-0.038	0.14
8.50	216.5	90.3	0.511	386.6	0.206	0.8573	647.	578.	0.00302	0.83	1.13	1.14	6.40	-0.059	0.14
9.50	215.5	94.3	0.478	413.7	0.215	0.8775	621.	552.	0.00316	0.84	1.15	1.11	5.85	-0.072	0.14
10.50	214.5	98.4	0.449	440.4	0.223	0.8942	578.	510.	0.00342	0.87	1.19	1.10	5.18	-0.090	0.15
11.50	213.3	102.6	0.423	467.6	0.231	0.9086	611.	542.	0.00327	0.83	1.17	1.05	5.29	-0.094	0.13
13.50	211.1	111.1	0.378	522.7	0.247	0.9313	629.	560.	0.00324	0.79	1.15	0.97	5.04	-0.111	0.12
15.50	208.4	119.6	0.342	578.5	0.265	0.9479	635.	565.	0.00327	0.78	1.12	0.94	4.73	-0.131	0.12
17.50	205.7	128.3	0.311	635.9	0.282	0.9603	634.	565.	0.00334	0.76	1.09	0.91	4.40	-0.154	0.11
19.50	202.7	137.0	0.284	674.9	0.300	0.9698	616.	547.	0.00352	0.77	1.07	0.89	3.99	-0.186	0.11
21.50	199.3	145.6	0.262	755.9	0.318	0.9769	603.	534.	0.00368	0.77	1.06	0.88	3.67	-0.218	0.11
RUN 85- 298 WEIGHT FLOW, 0.0863 HEAT INPUT, 36.80 INLET BULK TEMP, 77.8 OUTLET BULK TEMP, 206.1 PLOT CH D															
2.50	399.7	84.4	1.217	115.9	0.063	0.6149	362.	293.	0.00557	2.18	1.44	2.47	3.46	-0.071	0.60
4.50	399.0	92.7	1.000	141.0	0.072	0.7745	1000.	923.	0.00204	0.85	1.07	1.52	10.02	-0.028	0.20
6.50	398.0	103.9	0.823	171.3	0.082	0.8149	864.	797.	0.00230	0.90	1.12	1.32	7.67	-0.049	0.20
8.50	396.8	115.3	0.705	199.9	0.091	0.8712	793.	726.	0.00251	0.90	1.14	1.20	6.30	-0.075	0.20
9.50	396.0	121.0	0.660	213.7	0.095	0.8912	735.	668.	0.00271	0.91	1.15	1.15	5.52	-0.094	0.20
10.50	395.2	126.7	0.621	227.2	0.100	0.9073	714.	648.	0.00281	0.91	1.15	1.13	5.12	-0.110	0.20
11.50	394.3	132.4	0.586	240.7	0.103	0.9206	696.	630.	0.00291	0.91	1.15	1.10	4.76	-0.127	0.20
13.50	392.6	144.0	0.527	267.4	0.111	0.9444	691.	625.	0.00300	0.90	1.13	1.05	4.34	-0.155	0.19
15.50	391.3	154.7	0.483	291.6	0.118	0.9939	679.	613.	0.00313	0.89	1.10	1.03	3.96	-0.186	0.19
17.50	390.3	165.5	0.447	315.4	0.125	0.9999	692.	626.	0.00314	0.88	1.05	1.00	3.78	-0.209	0.18
19.50	389.7	176.4	0.416	338.9	0.131	0.9939	685.	619.	0.00325	0.87	1.02	0.98	3.51	-0.242	0.18
21.50	389.2	186.7	0.391	360.8	0.136	0.9939	688.	622.	0.00331	0.87	0.98	0.97	3.33	-0.270	0.18



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F, MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.04 TEST VOLTAGE, 23.0 HEAT INPUT/UNIT AREA, 0.711 ID, 0.335 OD, 0.375 LENGTH, 24.0														
887431.	615404.	2685010.	1.205	0.597	20.8381	3.153	0.2607	0.3444	0.00620	0.62	0.731	84.4	0.43	1.85
976712.	457628.	2360214.	1.198	0.593	12.9459	4.759	0.2771	0.3365	0.00656	0.64	0.627	77.9	0.38	1.81
1076275.	380042.	2091985.	1.203	0.610	8.7422	6.408	0.2954	0.3447	0.00662	0.66	0.589	74.3	0.37	1.79
1189079.	310792.	1789228.	1.214	0.632	6.0007	8.852	0.3157	0.3604	0.00660	0.68	0.560	70.1	0.35	1.79
1251084.	287289.	1655141.	1.221	0.641	5.0420	10.168	0.3264	0.3694	0.00653	0.69	0.546	68.5	0.35	1.80
1317277.	251760.	1472656.	1.229	0.654	4.1699	12.438	0.3374	0.3847	0.00646	0.71	0.529	65.7	0.33	1.84
1387932.	234737.	1347938.	1.237	0.659	3.5333	14.182	0.3489	0.3916	0.00635	0.72	0.517	64.3	0.33	1.87
1541850.	203803.	1106494.	1.252	0.669	2.5540	18.873	0.3722	0.4068	0.00611	0.75	0.493	61.3	0.33	1.96
1708139.	209535.	1007528.	1.259	0.670	1.9813	20.265	0.3942	0.4093	0.00585	0.75	0.485	61.8	0.35	2.00
1879249.	227599.	957052.	1.257	0.669	1.5907	20.309	0.4131	0.4074	0.00558	0.75	0.482	63.3	0.37	2.00
2046489.	286482.	1028181.	1.257	0.661	1.3667	16.642	0.4294	0.3940	0.00534	0.72	0.494	68.2	0.42	1.89
2205232.	324903.	1029521.	1.265	0.658	1.1464	15.527	0.4438	0.3894	0.00511	0.71	0.500	70.7	0.45	1.86
HEAT BALANCE, -0.07 TEST VOLTAGE, 43.5 HEAT INPUT/UNIT AREA, 1.724 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1776972.	109398.	252417.	0.921	0.689	0.4666	42.492	0.4051	0.4080	0.00947	2.00	0.994	40.7	0.95	2.82
1930547.	90799.	161951.	0.799	0.677	0.2513	57.163	0.3923	0.4117	0.00871	2.27	0.943	37.8	1.02	3.31
1976805.	172525.	186060.	0.694	0.682	0.1757	40.289	0.3732	0.4082	0.00705	2.14	0.884	42.0	1.03	3.14
1960441.	375551.	455832.	0.642	0.665	0.1832	12.068	0.3647	0.4261	0.00557	1.63	0.924	60.3	1.07	2.46
1942325.	197320.	248662.	0.626	0.689	0.1336	24.084	0.3619	0.4081	0.00558	1.96	0.832	49.0	1.01	2.91
1919142.	320154.	326124.	0.614	0.667	0.0154	13.519	0.3596	0.4263	0.00502	1.72	0.848	58.2	1.13	2.72
1893190.	239452.	239475.	0.606	0.692	0.0001	18.678	0.3579	0.4084	0.00494	1.90	0.806	52.8	1.11	2.90
1833544.	282690.	282715.	0.597	0.694	0.0001	14.778	0.3556	0.4092	0.00442	1.85	0.783	56.5	1.06	2.85
1775979.	304499.	304524.	0.598	0.693	0.0002	13.017	0.3593	0.4089	0.00408	1.85	0.761	58.7	1.01	2.86
1719415.	330561.	330588.	0.603	0.693	0.0002	11.327	0.3643	0.4090	0.00378	1.83	0.743	61.2	0.98	2.86
1666341.	429367.	429399.	0.610	0.666	0.0002	7.923	0.3596	0.4234	0.00347	1.72	0.750	68.1	0.97	2.80
1617401.	379371.	379399.	0.617	0.694	0.0002	8.846	0.3736	0.4090	0.00332	1.81	0.718	65.9	0.94	2.85
HEAT BALANCE, -0.07 TEST VOLTAGE, 43.5 HEAT INPUT/UNIT AREA, 1.766 ID, 0.335 OD, 0.375 LENGTH, 24.0														
2237369.	165226.	292191.	0.925	0.683	0.2178	34.825	0.4349	0.4100	0.01264	1.59	1.327	42.3	1.43	2.28
2253079.	77218.	109174.	0.689	0.684	0.0864	80.431	0.3738	0.4058	0.01103	2.10	1.160	32.1	1.42	3.20
2151081.	129535.	157474.	0.608	0.692	0.0566	43.552	0.3343	0.4043	0.00830	1.91	1.073	37.9	1.33	2.92
2019360.	195812.	223392.	0.591	0.691	0.0416	25.737	0.3139	0.4081	0.00676	1.78	1.015	43.8	1.25	2.73
1956101.	196599.	216171.	0.594	0.697	0.0350	24.527	0.3107	0.4050	0.00633	1.81	0.981	44.3	1.22	2.77
1894248.	227543.	245511.	0.598	0.690	0.0313	20.158	0.3091	0.4083	0.00588	1.77	0.957	46.8	1.19	2.73
1834465.	215883.	229621.	0.604	0.696	0.0268	20.488	0.3084	0.4045	0.00559	1.82	0.921	46.5	1.16	2.81
1721175.	227101.	236448.	0.716	0.693	0.0218	17.960	0.3095	0.4043	0.00503	1.84	0.863	48.2	1.11	2.88
1626681.	226900.	226922.	0.631	0.690	0.0001	16.855	0.3187	0.4042	0.00466	1.89	0.815	49.0	1.08	2.99
1541742.	236368.	236389.	0.644	0.689	0.0001	15.082	0.3295	0.4041	0.00432	1.90	0.778	50.5	1.03	3.04
1470098.	309290.	309313.	0.654	0.695	0.0002	10.233	0.3403	0.4043	0.00385	1.78	0.791	56.7	1.03	2.85
1410239.	271266.	271288.	0.663	0.688	0.0002	11.465	0.3515	0.4041	0.00377	1.88	0.738	54.7	0.97	3.05
HEAT BALANCE, -0.07 TEST VOLTAGE, 43.5 HEAT INPUT/UNIT AREA, 1.847 ID, 0.335 OD, 0.375 LENGTH, 24.0														
2556714.	186170.	329686.	0.934	0.684	0.2131	35.390	0.4375	0.4088	0.01193	1.63	1.273	46.4	1.37	2.25
2577731.	89503.	128294.	0.701	0.686	0.0891	79.212	0.3770	0.4040	0.01037	2.11	1.114	35.5	1.36	3.11
2477238.	143873.	177805.	0.616	0.693	0.0593	45.283	0.3371	0.4042	0.00797	1.95	1.040	41.2	1.28	2.87
2337085.	207440.	236716.	0.594	0.691	0.0431	28.469	0.3145	0.4080	0.00658	1.84	0.983	46.8	1.20	2.72
2266940.	224868.	250152.	0.593	0.690	0.0370	25.130	0.3087	0.4082	0.00612	1.83	0.953	48.3	1.17	2.72
2199220.	230195.	251096.	0.596	0.695	0.0318	23.494	0.3064	0.4063	0.00576	1.85	0.925	49.2	1.15	2.75
2133245.	248600.	266870.	0.601	0.694	0.0282	20.808	0.3053	0.4066	0.00541	1.83	0.901	50.8	1.12	2.74
2009053.	264248.	277163.	0.613	0.697	0.0225	18.001	0.3054	0.4047	0.00486	1.85	0.854	52.9	1.08	2.78
1898811.	267908.	267935.	0.625	0.694	0.0001	16.604	0.3097	0.4041	0.00446	1.89	0.805	54.0	1.05	2.87
1804716.	279525.	279551.	0.638	0.692	0.0001	14.877	0.3189	0.4041	0.00414	1.90	0.771	55.7	1.01	2.92
1719027.	269552.	269575.	0.649	0.689	0.0001	14.687	0.3289	0.4040	0.00392	1.96	0.731	55.8	0.96	3.03
1645017.	320007.	320030.	0.658	0.692	0.0002	11.294	0.3393	0.4040	0.00359	1.88	0.728	60.3	0.95	2.93
HEAT BALANCE, 0.16 TEST VOLTAGE, 36.0 HEAT INPUT/UNIT AREA, 1.405 ID, 0.335 OD, 0.375 LENGTH, 24.0														
3476772.	70440.	116295.	0.870	0.684	0.0988	140.401	0.4180	0.4054	0.01078	1.95	0.996	35.6	1.20	3.22
3437387.	152314.	207990.	0.682	0.690	0.0720	61.394	0.3559	0.4074	0.00780	1.64	0.939	44.3	1.11	2.70
3310580.	236265.	291201.	0.626	0.683	0.0538	36.982	0.3235	0.4134	0.00646	1.53	0.905	50.7	1.05	2.51
3156243.	306209.	354475.	0.608	0.685	0.0409	26.221	0.3040	0.4102	0.00565	1.47	0.879	55.5	1.02	2.40
3077046.	344767.	391888.	0.605	0.666	0.0363	22.249	0.2971	0.4086	0.00532	1.45	0.870	58.1	1.01	2.34
2999584.	405500.	450462.	0.605	0.687	0.0331	17.893	0.2916	0.4059	0.00505	1.40	0.876	61.7	1.01	2.25
2923751.	387859.	424484.	0.606	0.686	0.0284	18.315	0.2870	0.4085	0.00479	1.44	0.837	61.1	0.98	2.34
2777676.	401323.	426957.	0.611	0.685	0.0222	16.591	0.2821	0.4102	0.00434	1.45	0.793	62.6	0.94	2.40
2646288.	423431.	444973.	0.620	0.685	0.0180	14.710	0.2826	0.4111	0.00399	1.46	0.760	64.6	0.91	2.44
2525228.	450222.	467174.	0.629	0.684	0.0150	12.925	0.2845	0.4116	0.00369	1.46	0.735	66.9	0.88	2.46
2415421.	496408.	510180.	0.637	0.685	0.0130	10.869	0.2873	0.4109	0.00342	1.44	0.722	70.3	0.87	2.43
2318267.	537301.	548259.	0.644	0.685	0.0114	9.363	0.2913	0.4105	0.00319	1.43	0.713	73.4	0.87	2.42
HEAT BALANCE, 0.00 TEST VOLTAGE, 37.0 HEAT INPUT/UNIT AREA, 1.464 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1975544.	436042.	653889.	0.771	0.648	0.2454	9.337	0.3991	0.3529	0.01032	1.16	1.504	57.6	1.79	1.58
1957688.	97501.	131829.	0.658	0.688	0.0918	53.547	0.3656	0.4048	0.00858	1.71	0.987	33.9	1.21	3.02
1882909.	145567.	175704.	0.603	0.695	0.0662	32.903	0.3388	0.4051	0.00689	1.59	0.935	38.7	1.15	2.82
1793027.	190837.	215990.	0.590	0.691	0.0509	23.052	0.3262	0.4086	0.00591	1.53	0.890	42.7	1.10	2.74
1748523.	229547.	254061.	0.591	0.677	0.0467	18.351	0.3234	0.4152	0.00551	1.48	0.876	45.6	1.07	2.68
1705436.	251256.	273298.	0.593	0.678	0.0424	16.024	0.32							

TABLE IV. - Continued. UNIFORMLY

(c) Continued. Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HMW	H/HF	TW/TD	THETA	RDFM
RUN 87- 304 WEIGHT FLOW, 0.0687 HEAT INPUT, 32.50 INLET BULK TEMP, 85.4 OUTLET BULK TEMP, 230.5 PLOT CH F															
2.50	365.7	98.7	0.812	138.3	0.069	0.8004	895.	836.	0.00179	0.85	1.09	1.35	8.48	-0.041	0.18
4.50	365.2	111.6	0.675	166.3	0.077	0.8698	1107.	1042.	0.00158	0.73	1.08	1.21	9.34	-0.047	0.13
6.50	364.5	125.5	0.577	194.4	0.086	0.9137	1023.	961.	0.00169	0.75	1.06	1.10	7.65	-0.069	0.13
8.50	363.6	139.4	0.507	221.5	0.093	0.9402	929.	869.	0.00184	0.77	1.03	1.02	6.24	-0.098	0.14
9.50	363.0	145.9	0.479	234.1	0.097	0.9981	857.	798.	0.00198	0.79	1.02	0.99	5.47	-0.119	0.14
10.50	362.3	152.0	0.457	245.8	0.100	0.9999	823.	765.	0.00206	0.80	1.01	0.97	5.03	-0.137	0.15
11.50	361.5	157.9	0.436	257.2	0.104	0.9999	792.	735.	0.00215	0.80	1.00	0.96	4.65	-0.156	0.15
13.50	360.2	169.6	0.402	279.5	0.110	0.9999	770.	712.	0.00226	0.80	0.96	0.94	4.20	-0.187	0.15
15.50	359.4	181.0	0.373	300.8	0.115	0.9999	743.	686.	0.00239	0.81	0.94	0.92	3.79	-0.224	0.15
17.50	358.8	191.6	0.351	320.1	0.120	0.9999	746.	689.	0.00243	0.80	0.90	0.90	3.60	-0.249	0.15
19.50	358.3	202.0	0.331	339.1	0.125	0.9999	732.	675.	0.00253	0.81	0.88	0.90	3.34	-0.283	0.15
21.50	358.1	212.3	0.314	357.5	0.129	0.9999	732.	675.	0.00259	0.81	0.85	0.89	3.18	-0.312	0.15
RUN 89- 678 WEIGHT FLOW, 0.0924 HEAT INPUT, 29.60 INLET BULK TEMP, 83.4 OUTLET BULK TEMP, 177.9 PLOT CH H															
2.50	609.6	89.3	1.786	84.5	0.041	0.4876	592.	539.	0.00244	0.98	0.81	1.28	6.03	-0.023	0.64
4.50	609.1	94.8	1.565	96.5	0.046	0.5736	732.	679.	0.00204	0.81	0.78	1.14	7.16	-0.027	0.46
6.50	608.6	101.5	1.371	110.1	0.051	0.6644	845.	791.	0.00184	0.73	0.77	1.07	7.80	-0.033	0.36
8.50	608.1	109.1	1.211	124.7	0.056	0.7349	853.	799.	0.00185	0.70	0.78	0.99	7.33	-0.044	0.32
9.50	607.8	112.9	1.146	131.7	0.058	0.7628	799.	746.	0.00196	0.71	0.76	0.95	6.61	-0.054	0.33
10.50	607.6	116.8	1.088	138.8	0.060	0.7872	807.	754.	0.00196	0.70	0.78	0.93	6.45	-0.060	0.31
11.50	607.3	120.8	1.036	145.8	0.063	0.8082	752.	699.	0.00209	0.70	0.79	0.89	5.79	-0.072	0.32
13.50	606.8	128.7	0.947	159.4	0.067	0.8414	697.	644.	0.00227	0.70	0.80	0.85	5.01	-0.097	0.33
15.50	606.3	136.7	0.875	172.7	0.071	0.9918	643.	590.	0.00250	0.71	0.82	0.83	4.31	-0.128	0.31
17.50	605.7	144.6	0.814	185.6	0.075	0.9999	626.	573.	0.00261	0.71	0.82	0.81	3.96	-0.153	0.31
19.50	605.2	152.0	0.765	197.4	0.078	0.9999	596.	545.	0.00280	0.72	0.82	0.81	3.59	-0.186	0.32
21.50	604.7	159.3	0.722	209.0	0.082	0.9999	598.	545.	0.00285	0.72	0.81	0.80	3.42	-0.209	0.31
RUN 92- 303 WEIGHT FLOW, 0.0579 HEAT INPUT, 25.90 INLET BULK TEMP, 86.8 OUTLET BULK TEMP, 226.3 PLOT CH K															
2.50	390.8	99.2	0.868	109.0	0.054	0.7874	784.	746.	0.00162	0.87	1.05	1.29	7.52	-0.046	0.21
4.50	390.3	110.0	0.740	127.8	0.060	0.8515	645.	608.	0.00193	0.91	1.11	1.16	5.52	-0.082	0.23
6.50	389.8	120.7	0.651	145.2	0.065	0.8923	637.	600.	0.00199	0.88	1.10	1.08	4.97	-0.107	0.22
8.50	389.0	133.0	0.575	164.5	0.071	0.9231	941.	900.	0.00150	0.74	0.99	1.01	6.77	-0.083	0.15
9.50	388.5	139.7	0.541	174.9	0.073	0.9350	860.	822.	0.00161	0.76	0.99	0.98	5.88	-0.103	0.16
10.50	387.8	146.0	0.512	184.6	0.076	0.9975	833.	795.	0.00167	0.76	0.98	0.96	5.44	-0.119	0.15
11.50	387.2	152.0	0.488	193.7	0.079	0.9999	794.	756.	0.00175	0.77	0.96	0.94	4.98	-0.137	0.16
13.50	386.2	163.7	0.448	211.2	0.084	0.9999	765.	727.	0.00184	0.77	0.93	0.91	4.44	-0.168	0.16
15.50	385.6	175.2	0.415	228.0	0.088	0.9999	720.	682.	0.00199	0.78	0.91	0.89	3.90	-0.209	0.17
17.50	385.2	185.9	0.388	243.5	0.092	0.9999	719.	681.	0.00203	0.78	0.88	0.88	3.66	-0.236	0.16
19.50	385.0	196.2	0.366	258.1	0.096	0.9999	694.	657.	0.00215	0.79	0.86	0.87	3.35	-0.276	0.17
21.50	385.0	206.3	0.347	272.3	0.099	0.9999	695.	657.	0.00220	0.79	0.84	0.87	3.19	-0.304	0.16
RUN 94- 294 WEIGHT FLOW, 0.0925 HEAT INPUT, 24.00 INLET BULK TEMP, 72.0 OUTLET BULK TEMP, 139.7 PLOT CH M															
2.50	367.3	75.7	1.474	102.5	0.060	0.4708	551.	506.	0.00221	0.98	0.70	1.43	6.69	-0.017	0.46
4.50	366.7	79.6	1.258	120.2	0.068	0.5682	691.	645.	0.00188	0.79	0.72	1.26	8.10	-0.020	0.31
6.50	366.0	84.7	1.080	140.0	0.077	0.6573	681.	635.	0.00192	0.75	0.76	1.13	7.50	-0.030	0.28
8.50	365.1	90.4	0.943	160.3	0.084	0.7296	635.	589.	0.00204	0.75	0.80	1.04	6.52	-0.045	0.26
9.50	364.4	93.4	0.887	170.4	0.088	0.7594	588.	543.	0.00219	0.77	0.83	1.01	5.82	-0.056	0.27
10.50	363.7	96.4	0.838	180.4	0.091	0.7852	557.	512.	0.00230	0.78	0.85	0.99	5.31	-0.068	0.27
11.50	362.9	99.5	0.794	190.4	0.094	0.8080	536.	492.	0.00240	0.78	0.87	0.97	4.94	-0.080	0.27
13.50	361.5	105.9	0.719	210.1	0.100	0.8457	515.	471.	0.00253	0.78	0.90	0.93	4.45	-0.104	0.27
15.50	360.6	112.2	0.661	228.7	0.106	0.8743	486.	443.	0.00273	0.79	0.92	0.91	3.95	-0.134	0.27
17.50	360.1	118.6	0.613	246.6	0.112	0.8964	477.	434.	0.00284	0.78	0.93	0.89	3.66	-0.161	0.26
19.50	359.7	125.1	0.572	264.3	0.117	0.9141	458.	416.	0.00303	0.79	0.94	0.86	3.33	-0.196	0.26
21.50	359.4	131.6	0.537	281.7	0.122	0.9282	450.	408.	0.00316	0.80	0.95	0.85	3.10	-0.231	0.26
RUN 95- 301 WEIGHT FLOW, 0.0415 HEAT INPUT, 21.90 INLET BULK TEMP, 90.8 OUTLET BULK TEMP, 236.3 PLOT CH N															
2.50	412.3	105.3	0.839	90.9	0.038	0.8154	756.	715.	0.00137	0.92	1.12	1.28	6.79	-0.057	0.22
4.50	412.0	119.0	0.764	96.3	0.043	0.8787	944.	901.	0.00123	0.83	1.10	1.20	7.57	-0.062	0.17
6.50	411.6	134.6	0.600	113.0	0.048	0.9204	978.	933.	0.00123	0.80	1.06	1.10	6.93	-0.081	0.15
8.50	410.9	150.2	0.526	128.9	0.053	0.9999	920.	878.	0.00130	0.79	1.01	1.02	5.84	-0.110	0.15
9.50	410.4	157.3	0.498	136.2	0.055	0.9999	853.	811.	0.00138	0.80	0.99	0.99	5.16	-0.133	0.16
10.50	410.0	164.2	0.474	143.1	0.057	0.9999	823.	782.	0.00142	0.80	0.97	0.96	4.76	-0.152	0.16
11.50	409.7	171.0	0.452	149.9	0.058	0.9999	796.	755.	0.00148	0.80	0.95	0.95	4.41	-0.173	0.16
13.50	409.1	184.0	0.417	162.6	0.062	0.9999	762.	722.	0.00156	0.81	0.91	0.92	3.92	-0.212	0.17
15.50	408.6	195.8	0.390	174.0	0.065	0.9999	719.	679.	0.00168	0.82	0.87	0.91	3.47	-0.260	0.17
17.50	408.3	207.3	0.366	185.1	0.067	0.9999	722.	682.	0.00171	0.81	0.86	0.90	3.29	-0.289	0.17
19.50	408.0	218.5	0.346	195.8	0.070	0.9999	687.	648.	0.00184	0.83	0.85	0.91	2.96	-0.346	0.17
21.50	407.8	229.1	0.329	205.8	0.072	0.9999	702.	662.	0.00185	0.82	0.83	0.89	2.89	-0.367	0.17
RUN 96- 673 WEIGHT FLOW, 0.0683 HEAT INPUT, 18.00 INLET BULK TEMP, 99.1 OUTLET BULK TEMP, 177.9 PLOT CH O															
2.50	818.5	105.1	1.756	63.6	0.027	0.5590	368.	329.	0.00296	1.10	0.94	1.20	3.13	-0.075	1.00
4.50	818.3	110.2	1.620	68.9	0.029	0.6136	390.	352.	0.00279	1.00	0.91	1.10	3.19	-0.091	0.88
6.50	818.1	115.5	1.501	74.4	0.031	0.6632	421.	385.	0.00256	0.90	0.87	0.99	3.33	-0.101	0.78
8.50	817.9	121.2	1.395	80.0	0.033	0.6988	437.	401.	0.00249	0.85	0.85	0.93	3.31	-0.118	0.71
9.50	817.8	124.1	1.346	82.9	0.034	0.9731	455.	417.	0.00240	0.81	0.83	0.89	3.37	-0.122	0.55
10.50	817.7	127.1	1.301	85.8	0.035	0.9952	452.	415.	0.00244	0.81	0.83	0.88	3.27	-0.135	0.54
11.50	817.6	130.2	1.257	88.7	0.036	0.9999	473.	436.	0.00234	0.77	0.81	0.85	3.35	-0.137	0.52
13.50	817.5	136.6	1.178	94.7	0.037	0.9999	489.	452.	0.00229	0.74	0.77	0.82	3.30	-0.154	0.50
15.50	817.3	143.3	1.107	100.8	0.039	0.9999	493.	455.	0.00232	0.73	0.77	0.80	3.18	-0.177	0.49
17.50	817.1	149.6	1.048	106.5	0.041	0.9999	512.	474.	0.00226	0.70	0.75	0.77	3.17	-0.189	0.47
19.50	816.9	156.0	0.995	112.2	0.043	0.9999	512.	475.	0.00230	0.70	0.75	0.76	3.04	-0.213	0.47
21.50	816.7	162.5	0.947	117.8	0.044	0.9999	528.	490.	0.00226	0.68	0.73	0.74	3.01	-0.227	0.45

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F, MN	PR-B	PR-F	XITF	VIS-RAT	PHI-B	PHI-F	EFLUX	QDOL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.04 TEST VOLTAGE, 35.0 HEAT INPUT/UNIT AREA, 1.264 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1558773.	101731.	123213.	0.612	0.693	0.0655	19.782	0.3412	0.4047	0.00759	1.32	0.934	30.7	1.15	2.88
1470821.	86191.	92023.	0.591	0.682	0.0602	45.147	0.3218	0.4070	0.00692	1.47	0.857	29.2	1.10	3.27
1378710.	111203.	120740.	0.595	0.685	0.0311	31.644	0.3163	0.4046	0.00582	1.41	0.798	32.3	1.03	3.14
1295874.	142850.	150728.	0.606	0.689	0.0266	22.155	0.3154	0.4045	0.00501	1.34	0.758	35.8	0.98	3.01
1259927.	168174.	168443.	0.612	0.692	0.0013	17.708	0.3169	0.4047	0.00464	1.29	0.749	38.2	0.99	2.92
1228763.	185028.	185046.	0.619	0.694	0.0001	15.348	0.3208	0.4047	0.00439	1.26	0.741	39.8	0.97	2.87
1199698.	202080.	202105.	0.626	0.695	0.0001	13.411	0.3249	0.4049	0.00417	1.24	0.736	41.4	0.96	2.83
1146469.	223217.	223235.	0.637	0.696	0.0002	11.242	0.3334	0.4051	0.00385	1.22	0.720	43.6	0.94	2.81
1099220.	246491.	246508.	0.647	0.697	0.0002	9.430	0.3423	0.4055	0.00357	1.21	0.710	45.9	0.92	2.78
1059672.	255291.	255309.	0.655	0.696	0.0002	8.618	0.3518	0.4052	0.00338	1.21	0.698	47.1	0.90	2.81
1023626.	272003.	272025.	0.662	0.696	0.0002	7.600	0.3613	0.4052	0.00320	1.20	0.693	48.9	0.90	2.80
990671.	281170.	281195.	0.668	0.696	0.0001	6.979	0.3707	0.4050	0.00305	1.20	0.686	50.1	0.89	2.82
HEAT BALANCE, -0.09 TEST VOLTAGE, 33.0 HEAT INPUT/UNIT AREA, 1.246 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1745401.	199577.	362152.	0.874	0.670	0.3613	21.042	0.4095	0.4212	0.00677	1.07	0.793	46.1	0.83	2.36
1796603.	161225.	257926.	0.776	0.671	0.2364	27.939	0.3931	0.4212	0.00612	1.19	0.733	42.3	0.81	2.65
1810175.	143421.	205094.	0.695	0.694	0.1637	31.838	0.3762	0.4075	0.00555	1.27	0.707	40.6	0.82	2.79
1793627.	157677.	206011.	0.641	0.693	0.1260	28.361	0.3623	0.4072	0.00498	1.28	0.677	41.8	0.81	2.83
1778432.	182867.	230439.	0.626	0.694	0.1170	23.724	0.3586	0.4091	0.00467	1.24	0.669	44.1	0.81	2.75
1760248.	188156.	230510.	0.614	0.695	0.1056	22.686	0.3556	0.4081	0.00446	1.25	0.657	44.6	0.80	2.77
1739987.	219744.	262227.	0.606	0.681	0.1004	18.852	0.3531	0.4152	0.00423	1.21	0.647	47.1	0.79	2.73
1696441.	265999.	305132.	0.596	0.671	0.0907	14.679	0.3494	0.4212	0.00386	1.17	0.636	50.6	0.78	2.69
1651324.	319097.	321112.	0.592	0.672	0.0061	11.388	0.3471	0.4238	0.00354	1.13	0.637	54.5	0.83	2.66
1606618.	349428.	349458.	0.593	0.672	0.0001	9.843	0.3461	0.4240	0.00329	1.12	0.630	56.9	0.81	2.65
1566142.	389843.	389874.	0.597	0.672	0.0002	8.301	0.3492	0.4232	0.00310	1.10	0.633	59.8	0.81	2.60
1527035.	405653.	405684.	0.603	0.672	0.0002	7.644	0.3527	0.4235	0.00294	1.10	0.624	61.2	0.80	2.62
HEAT BALANCE, -0.06 TEST VOLTAGE, 30.0 HEAT INPUT/UNIT AREA, 1.080 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1292282.	101772.	126802.	0.617	0.692	0.0771	32.334	0.3466	0.4082	0.00745	1.05	0.900	28.4	1.09	2.73
1235114.	158663.	181133.	0.592	0.680	0.0615	18.762	0.3285	0.4177	0.00614	0.96	0.875	33.1	1.04	2.55
1177526.	178790.	197469.	0.591	0.680	0.0482	15.435	0.3224	0.4178	0.00545	0.95	0.838	34.9	1.01	2.56
1115310.	108975.	116976.	0.598	0.687	0.0319	25.432	0.3196	0.4047	0.00534	1.15	0.747	29.9	0.96	3.05
1083562.	130327.	138055.	0.603	0.691	0.0306	19.991	0.3193	0.4049	0.00490	1.10	0.734	32.1	0.94	2.93
1054916.	142459.	142757.	0.609	0.692	0.0017	17.455	0.3206	0.4049	0.00462	1.08	0.721	33.4	0.95	2.91
1029600.	158169.	158184.	0.615	0.694	0.0001	14.973	0.3243	0.4050	0.00436	1.06	0.714	34.9	0.94	2.86
983307.	177648.	177664.	0.628	0.695	0.0001	12.314	0.3321	0.4052	0.00399	1.04	0.698	37.0	0.91	2.83
942092.	204341.	204356.	0.639	0.695	0.0002	9.845	0.3404	0.4066	0.00367	1.01	0.689	39.5	0.89	2.77
906727.	213530.	213553.	0.648	0.697	0.0302	8.861	0.3493	0.4058	0.00345	1.01	0.677	40.7	0.88	2.79
875807.	233266.	233283.	0.655	0.694	0.0002	7.598	0.3584	0.4071	0.00325	0.99	0.675	42.6	0.87	2.77
847609.	240315.	240335.	0.661	0.697	0.0002	6.981	0.3674	0.4059	0.00310	0.99	0.668	43.6	0.87	2.78
HEAT BALANCE, 0.01 TEST VOLTAGE, 25.0 HEAT INPUT/UNIT AREA, 0.958 ID, 0.335 OD, 0.375 LENGTH, 24.0														
2114112.	170786.	335772.	1.054	0.682	0.2992	31.325	0.4557	0.4097	0.00806	0.95	0.812	43.8	0.85	2.21
2176470.	138406.	232951.	0.849	0.680	0.1882	41.291	0.4178	0.4170	0.00720	1.06	0.766	39.8	0.84	2.54
2189025.	162687.	239488.	0.725	0.680	0.1373	34.823	0.3868	0.4172	0.00627	1.06	0.744	41.4	0.84	2.54
2164926.	204530.	272926.	0.656	0.681	0.1070	26.611	0.3634	0.4149	0.00551	1.02	0.727	44.4	0.83	2.45
2144545.	242367.	311140.	0.635	0.682	0.0980	21.669	0.3539	0.4125	0.00510	0.98	0.727	47.0	0.84	2.35
2120888.	276011.	343149.	0.619	0.682	0.0894	18.398	0.3458	0.4110	0.00491	0.96	0.727	49.2	0.84	2.29
2094812.	305042.	369143.	0.608	0.682	0.0616	16.128	0.3386	0.4100	0.00467	0.94	0.725	51.0	0.84	2.25
2037378.	349150.	404944.	0.594	0.682	0.0679	13.297	0.3267	0.4093	0.00426	0.93	0.715	53.7	0.83	2.22
1978368.	405087.	455115.	0.591	0.682	0.0587	10.712	0.3204	0.4081	0.00394	0.90	0.716	57.0	0.84	2.17
1920113.	439072.	481877.	0.592	0.682	0.0510	9.347	0.3172	0.4080	0.00366	0.90	0.708	59.2	0.83	2.16
1863209.	487589.	525222.	0.596	0.682	0.0456	7.802	0.3154	0.4074	0.00343	0.88	0.713	62.1	0.84	2.14
1808564.	522069.	554223.	0.600	0.682	0.0411	6.840	0.3146	0.4071	0.00321	0.87	0.711	64.4	0.84	2.13
HEAT BALANCE, 0.05 TEST VOLTAGE, 25.0 HEAT INPUT/UNIT AREA, 0.880 ID, 0.335 OD, 0.375 LENGTH, 24.0														
893959.	83997.	101074.	0.602	0.685	0.0714	26.672	0.3394	0.4115	0.00763	0.84	0.921	22.9	1.12	2.71
843596.	68977.	77562.	0.590	0.688	0.0451	31.054	0.3273	0.4049	0.00710	0.96	0.868	21.7	1.10	3.03
788460.	74865.	80526.	0.596	0.686	0.0338	26.286	0.3231	0.4048	0.00624	0.98	0.808	22.7	1.05	3.11
739404.	90869.	90878.	0.610	0.688	0.0001	19.528	0.3263	0.4049	0.00538	0.94	0.759	24.7	1.02	3.06
718843.	105750.	105760.	0.618	0.691	0.0001	15.785	0.3307	0.4051	0.00495	0.90	0.744	26.3	0.99	2.96
700028.	115469.	115479.	0.625	0.692	0.0001	13.762	0.3353	0.4051	0.00466	0.88	0.732	27.4	0.96	2.92
682568.	125206.	125216.	0.632	0.693	0.0002	12.095	0.3400	0.4052	0.00440	0.86	0.721	28.4	0.95	2.89
651873.	140728.	140740.	0.643	0.694	0.0002	9.890	0.3499	0.4052	0.00401	0.84	0.707	30.1	0.92	2.85
626484.	159329.	159341.	0.652	0.696	0.0002	8.033	0.3601	0.4058	0.00369	0.81	0.704	32.0	0.91	2.80
603760.	164782.	164796.	0.660	0.695	0.0001	7.337	0.3702	0.4055	0.00350	0.81	0.694	32.9	0.90	2.83
583512.	182003.	182021.	0.665	0.697	0.0001	6.195	0.3792	0.4060	0.00327	0.79	0.699	34.7	0.91	2.79
565768.	182284.	182303.	0.669	0.695	0.0001	5.852	0.3855	0.4054	0.00316	0.80	0.690	35.1	0.89	2.83
HEAT BALANCE, -0.09 TEST VOLTAGE, 24.0 HEAT INPUT/UNIT AREA, 0.705 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1187408.	359190.	522328.	0.743	0.635	0.4306	6.731	0.3804	0.4045	0.00505	0.66	0.811	50.2	0.93	1.95
1197739.	351590.	483112.	0.704	0.641	0.3506	6.466	0.3742	0.4107	0.00465	0.67	0.769	49.7	0.89	2.03
1198481.	333460.	438246.	0.672	0.649	0.2904	6.931	0.3702	0.4195	0.00428	0.69	0.722	48.7	0.84	2.14
1191885.	334368.	421797.	0.647	0.652	0.2525	6.871	0.3668	0.4246	0.00397	0.70	0.697	48.9	0.81	2.21
1186400.	325044.	329771.	0.637	0.655	0.0170	7.139	0.3654	0.4289	0.00382	0.71	0.675	48.4	0.88	2.37
1179740.	336505.	336916.	0.627	0.655	0.0019	6.767	0.3642	0.4289	0.00370	0.70	0.674	49.2	0.88	2.37
1172081.	324803.	324827.	0.622	0.657	0.0002	7.081	0.3632	0.4287	0.00357	0.71	0.650	48.6	0.85	2.42
1154277.	325624.	325654.	0.611	0.658	0.0002	6.929	0.3616	0.4286	0.00335	0.72	0.628	48.9	0.82	2.46
1134276.	336885.	336909.	0.604	0.659	0.0002	6.483	0.3606	0.4287	0.00315	0.72	0.617	49.9	0.80	2.48
1114372.	332567.	332590.	0.602	0.660	0.0002	6.453	0.3629	0.4288	0.00298	0.73	0.597	49.9	0.77	2.53
1094023.	344053.	344077.	0.602	0.660	0.0002	6.075	0.3659	0.4289	0.00284	0.73	0.591	51.0	0.76	2.55
1073445.	341893.	341918.	0.604	0.661	0.0002	5.933	0.3690	0.4292	0.00270	0.74	0.575	51.2	0.74	2.59

TABLE IV. - Continued. UNIFORMLY

(c) Concluded. Test section 3; tube inside diameter, 0.335 inch; tube outside

EL	P8	T8	ROB	VELOC	M	X2	TU	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	RDFM
RUN100- 670 WEIGHT FLOW, 0.0676 HEAT INPUT, 18.10 INLET BULK TEMP, 85.4 OUTLET BULK TEMP, 146.4 PLOT CH S															
2.50	531.1	89.5	1.513	94.6	0.047	0.5638	324.	282.	0.00357	1.29	0.88	1.43	3.15	-0.073	0.83
4.50	530.7	93.2	1.387	103.2	0.051	0.6202	348.	307.	0.00327	1.13	0.86	1.26	3.29	-0.083	0.71
6.50	530.4	97.2	1.274	112.3	0.054	0.6714	375.	336.	0.00299	1.00	0.83	1.12	3.45	-0.091	0.62
8.50	530.1	101.6	1.175	121.8	0.057	0.7172	399.	360.	0.00280	0.90	0.81	1.02	3.54	-0.101	0.55
9.50	529.9	103.9	1.131	126.6	0.059	0.7378	375.	335.	0.00308	0.95	0.86	1.06	3.23	-0.123	0.56
10.50	529.7	106.3	1.089	131.5	0.060	0.7570	419.	381.	0.00268	0.83	0.80	0.94	3.58	-0.112	0.50
11.50	529.6	108.7	1.050	136.4	0.062	0.7747	384.	345.	0.00303	0.90	0.86	1.00	3.18	-0.141	0.52
13.50	529.2	113.5	0.982	145.8	0.065	0.8049	399.	361.	0.00293	0.85	0.84	0.94	3.18	-0.154	0.48
15.50	528.9	118.5	0.921	155.4	0.068	0.8308	396.	357.	0.00303	0.84	0.85	0.92	3.01	-0.180	0.47
17.50	528.6	123.7	0.867	165.1	0.072	0.8529	425.	387.	0.00280	0.77	0.81	0.84	3.13	-0.183	0.43
19.50	528.2	129.1	0.818	174.9	0.074	0.8715	421.	383.	0.00290	0.76	0.82	0.83	2.97	-0.211	0.42
21.50	527.9	134.6	0.775	184.8	0.077	0.8868	435.	397.	0.00283	0.73	0.80	0.79	2.95	-0.225	0.40
RUN101- 366 WEIGHT FLOW, 0.1040 HEAT INPUT, 21.70 INLET BULK TEMP, 61.8 OUTLET BULK TEMP, 111.2 PLOT CH T															
2.50	200.6	65.0	0.915	185.6	0.129	0.5636	939.	894.	0.00129	0.46	0.57	1.26	13.77	-0.005	0.14
4.50	199.6	68.6	0.767	221.6	0.145	0.6593	697.	655.	0.00159	0.56	0.66	1.06	9.54	-0.013	0.15
6.50	198.4	72.7	0.664	255.9	0.160	0.7303	598.	556.	0.00181	0.62	0.73	0.98	7.64	-0.025	0.16
8.50	197.2	77.3	0.587	289.5	0.172	0.7845	542.	500.	0.00199	0.65	0.79	0.93	6.48	-0.039	0.16
9.50	196.5	79.6	0.555	306.2	0.178	0.8066	515.	474.	0.00210	0.67	0.81	0.91	5.95	-0.048	0.16
10.50	195.8	82.0	0.526	322.7	0.184	0.8260	472.	431.	0.00230	0.72	0.85	0.92	5.26	-0.061	0.17
11.50	195.1	84.5	0.501	339.3	0.189	0.8431	491.	450.	0.00222	0.68	0.85	0.87	5.33	-0.065	0.16
13.50	193.6	89.7	0.455	373.3	0.200	0.8724	499.	458.	0.00222	0.65	0.86	0.82	5.11	-0.079	0.15
15.50	192.0	95.1	0.416	408.2	0.211	0.8959	502.	461.	0.00224	0.64	0.86	0.79	4.85	-0.095	0.14
17.50	190.4	100.7	0.383	443.9	0.222	0.9149	503.	461.	0.00227	0.63	0.86	0.76	4.58	-0.112	0.14
19.50	188.5	106.5	0.354	480.6	0.232	0.9301	490.	449.	0.00237	0.63	0.88	0.74	4.21	-0.135	0.14
21.50	186.3	112.0	0.328	517.4	0.244	0.9422	477.	436.	0.00248	0.63	0.88	0.73	3.90	-0.160	0.13
RUN102- 367 WEIGHT FLOW, 0.1310 HEAT INPUT, 22.30 INLET BULK TEMP, 61.9 OUTLET BULK TEMP, 95.9 PLOT CH U															
2.50	199.4	64.3	0.938	228.2	0.160	0.5479	851.	806.	0.00145	0.45	0.49	1.12	12.52	-0.005	0.15
4.50	198.1	67.1	0.807	265.2	0.178	0.6296	677.	633.	0.00171	0.52	0.57	0.97	9.44	-0.011	0.16
6.50	196.7	70.2	0.710	301.4	0.194	0.6948	584.	539.	0.00195	0.57	0.63	0.91	7.69	-0.020	0.17
8.50	195.2	73.6	0.635	337.2	0.208	0.7472	530.	486.	0.00214	0.60	0.68	0.87	6.60	-0.031	0.17
9.50	194.4	75.4	0.603	355.0	0.215	0.7694	500.	456.	0.00226	0.62	0.71	0.86	6.05	-0.039	0.17
10.50	193.5	77.2	0.574	373.0	0.222	0.7892	452.	409.	0.00251	0.69	0.75	0.89	5.30	-0.050	0.19
11.50	192.5	79.1	0.548	390.9	0.228	0.8071	464.	421.	0.00246	0.66	0.75	0.85	5.33	-0.054	0.18
13.50	190.5	83.0	0.500	427.8	0.241	0.8384	462.	419.	0.00250	0.64	0.77	0.81	5.05	-0.067	0.17
15.50	188.4	87.2	0.460	465.7	0.254	0.8643	463.	421.	0.00252	0.63	0.78	0.78	4.83	-0.080	0.16
17.50	186.0	91.5	0.423	505.4	0.267	0.8860	460.	417.	0.00257	0.62	0.79	0.75	4.56	-0.096	0.15
19.50	183.7	95.9	0.392	545.6	0.280	0.9038	452.	409.	0.00266	0.62	0.80	0.73	4.27	-0.114	0.15
21.50	180.9	100.4	0.364	587.9	0.294	0.9188	435.	392.	0.00282	0.64	0.83	0.74	3.90	-0.138	0.15
RUN103- 315 WEIGHT FLOW, 0.0290 HEAT INPUT, 13.80 INLET BULK TEMP, 115.3 OUTLET BULK TEMP, 260.0 PLOT CH V															
2.50	207.5	129.6	0.310	153.7	0.068	0.9615	446.	402.	0.00165	1.05	1.37	1.16	3.16	-0.245	0.15
4.50	207.3	141.8	0.280	170.1	0.072	0.9730	528.	490.	0.00144	0.93	1.26	1.05	3.46	-0.232	0.12
6.50	207.1	153.8	0.256	186.0	0.077	0.9999	545.	506.	0.00145	0.91	1.19	1.01	3.29	-0.262	0.12
8.50	206.7	166.0	0.235	202.4	0.081	0.9999	620.	582.	0.00132	0.84	1.08	0.95	3.50	-0.252	0.10
9.50	206.5	172.3	0.226	210.7	0.083	0.9999	590.	551.	0.00141	0.86	1.07	0.95	3.20	-0.293	0.11
10.50	206.3	178.5	0.218	219.0	0.086	0.9999	619.	581.	0.00137	0.84	1.03	0.93	3.25	-0.292	0.10
11.50	206.0	184.4	0.210	226.9	0.088	0.9999	619.	581.	0.00139	0.84	1.01	0.93	3.15	-0.311	0.10
13.50	205.6	196.2	0.196	242.6	0.091	0.9999	686.	648.	0.00129	0.81	0.93	0.90	3.30	-0.299	0.09
15.50	205.2	208.2	0.184	258.4	0.095	0.9999	669.	631.	0.00136	0.82	0.90	0.90	3.03	-0.348	0.09
17.50	205.0	220.1	0.174	273.8	0.099	0.9999	719.	680.	0.00130	0.80	0.85	0.88	3.09	-0.346	0.08
19.50	204.8	231.5	0.165	288.7	0.102	0.9999	689.	651.	0.00139	0.81	0.84	0.88	2.81	-0.406	0.09
21.50	204.6	242.8	0.157	303.4	0.105	0.9999	718.	680.	0.00137	0.80	0.81	0.87	2.80	-0.416	0.08
RUN105- 671 WEIGHT FLOW, 0.0642 HEAT INPUT, 17.10 INLET BULK TEMP, 88.7 OUTLET BULK TEMP, 169.5 PLOT CH X															
2.50	617.6	94.1	1.615	65.0	0.031	0.5619	384.	350.	0.00247	1.12	0.87	1.27	3.72	-0.058	0.79
4.50	617.5	98.9	1.460	71.9	0.033	0.6288	454.	401.	0.00216	0.95	0.83	1.10	4.06	-0.065	0.65
6.50	617.3	104.4	1.325	79.2	0.036	0.6884	474.	440.	0.00200	0.84	0.81	0.98	4.22	-0.074	0.55
8.50	617.2	110.2	1.210	86.7	0.038	0.7388	509.	466.	0.00192	0.79	0.80	0.92	4.23	-0.087	0.48
9.50	617.1	113.2	1.159	90.5	0.040	0.7603	496.	462.	0.00195	0.78	0.80	0.90	4.08	-0.097	0.48
10.50	617.1	116.3	1.113	94.3	0.041	0.7798	522.	488.	0.00186	0.74	0.78	0.86	4.19	-0.100	0.45
11.50	617.0	119.5	1.069	98.2	0.042	0.7975	511.	477.	0.00192	0.74	0.79	0.85	3.99	-0.112	0.45
13.50	616.9	126.1	0.991	105.9	0.045	0.8275	528.	493.	0.00189	0.71	0.78	0.81	3.91	-0.127	0.42
15.50	616.7	132.9	0.923	113.7	0.047	0.8610	525.	491.	0.00194	0.70	0.78	0.79	3.69	-0.150	0.36
17.50	616.6	139.9	0.863	121.6	0.049	0.8999	540.	505.	0.00192	0.68	0.76	0.76	3.61	-0.166	0.35
19.50	616.5	146.8	0.812	129.2	0.052	0.9399	527.	493.	0.00201	0.64	0.76	0.76	3.36	-0.195	0.35
21.50	616.3	153.5	0.770	136.4	0.054	0.9999	530.	496.	0.00203	0.67	0.75	0.74	3.23	-0.217	0.34
RUN106- 299 WEIGHT FLOW, 0.0975 HEAT INPUT, 17.60 INLET BULK TEMP, 75.0 OUTLET BULK TEMP, 124.3 PLOT CH Y															
2.50	342.9	78.0	1.212	131.4	0.076	0.5696	324.	268.	0.00337	1.31	0.77	1.50	3.43	-0.057	0.60
4.50	342.4	80.8	1.102	144.5	0.082	0.6251	378.	325.	0.00277	1.03	0.73	1.21	4.02	-0.056	0.47
6.50	341.8	84.1	1.005	158.6	0.088	0.6767	393.	341.	0.00267	0.94	0.74	1.10	4.06	-0.066	0.42
8.50	341.0	87.7	0.919	173.4	0.093	0.7232	418.	367.	0.00252	0.85	0.74	1.00	4.18	-0.074	0.37
9.50	340.5	89.6	0.880	181.0	0.096	0.7444	413.	361.	0.00258	0.84	0.76	0.99	4.03	-0.083	0.36
10.50	339.9	91.6	0.844	188.7	0.099	0.7640	416.	365.	0.00257	0.82	0.76	0.96	3.99	-0.090	0.35
11.50	339.4	93.7	0.810	196.6	0.101	0.7822	417.	366.	0.00258	0.81	0.77	0.94	3.91	-0.098	0.34
13.50	338.5	98.1	0.750	212.4	0.106	0.8144	438.	387.	0.00248	0.75	0.77	0.87	3.95	-0.108	0.31
15.50	337.8	102.8	0.697	228.4	0.111	0.8425	425.	374.	0.00261	0.75	0.80	0.86	3.64	-0.132	0.30
17.50	337.2	107.6	0.652	244.3	0.116	0.8657	428.	377.	0.00264	0.73	0.81	0.83	3.50	-0.151	0.29
19.50	336.8	112.3	0.614	259.5	0.121	0.8844	408.	358.	0.00286	0.76	0.83	0.84	3.17	-0.186	0.30
21.50	336.6	117.0	0.581	274.2	0.125	0.9000	399.	347.	0.00300	0.77	0.85	0.84	2.97	-0.218	0.29

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.375 inch; heated tube length, 24 inches; material, stainless steel

RE-B	RE-F	RE-F, MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	QDOL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.08 TEST VOLTAGE, 23.7 HEAT INPUT/UNIT AREA, 0.735 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1787904.	473702.	732471.	0.811	0.631	0.3504	7.400	0.4029	0.3626	0.00567	0.69	0.857	61.1	1.01	1.65
1803539.	455739.	560339.	0.745	0.642	0.2764	7.866	0.3897	0.3738	0.00519	0.70	0.809	59.8	0.95	1.74
1805035.	433760.	593912.	0.695	0.653	0.2202	8.398	0.3778	0.3868	0.00475	0.71	0.758	58.4	0.88	1.85
1795012.	421617.	549139.	0.657	0.659	0.1791	8.661	0.3671	0.3744	0.00435	0.72	0.715	57.6	0.84	1.94
1786666.	476611.	604076.	0.642	0.655	0.1705	7.370	0.3622	0.3884	0.00426	0.71	0.749	60.4	0.89	1.87
1776363.	416023.	512229.	0.629	0.664	0.1488	8.712	0.3577	0.4012	0.00401	0.73	0.684	57.3	0.80	2.02
1764614.	485296.	591421.	0.619	0.658	0.1443	7.098	0.3539	0.3923	0.00395	0.72	0.727	60.9	0.87	1.91
1783649.	482080.	569741.	0.606	0.662	0.1238	7.035	0.3493	0.3977	0.00368	0.72	0.697	60.9	0.83	1.98
1709378.	510457.	568888.	0.598	0.662	0.1100	6.394	0.3457	0.3982	0.00347	0.72	0.696	62.5	0.84	1.98
1677759.	481524.	542505.	0.593	0.668	0.0953	6.747	0.3428	0.4076	0.00322	0.74	0.651	61.4	0.78	2.10
1644749.	507500.	560685.	0.591	0.668	0.0870	6.141	0.3407	0.4080	0.00305	0.74	0.650	63.0	0.78	2.10
1611153.	502726.	547145.	0.591	0.671	0.0791	6.064	0.3391	0.4134	0.00287	0.74	0.627	63.1	0.75	2.17
HEAT BALANCE, 0.10 TEST VOLTAGE, 26.5 HEAT INPUT/UNIT AREA, 0.802 ID, 0.335 OD, 0.375 LENGTH, 24.0														
3102044.	72448.	126409.	0.977	0.693	0.1160	120.166	0.4426	0.4031	0.00775	1.07	0.695	33.5	0.81	2.90
3116277.	141890.	211956.	0.770	0.683	0.0956	60.311	0.3846	0.4133	0.00621	0.93	0.683	40.3	0.77	2.52
3073692.	206422.	273965.	0.682	0.687	0.0773	39.436	0.3499	0.4069	0.00546	0.87	0.687	45.0	0.77	2.29
2999858.	267992.	337843.	0.641	0.688	0.0630	28.703	0.3270	0.4032	0.00492	0.84	0.687	48.9	0.77	2.17
2956758.	303973.	372941.	0.629	0.689	0.0576	24.466	0.3183	0.4013	0.00471	0.83	0.690	51.0	0.77	2.11
2911865.	362736.	434730.	0.621	0.688	0.0540	19.623	0.3109	0.3914	0.00455	0.80	0.708	54.3	0.80	1.97
2865294.	354585.	418860.	0.616	0.689	0.0476	19.808	0.3047	0.3985	0.00433	0.81	0.683	53.9	0.77	2.05
2768253.	371766.	423063.	0.610	0.689	0.0386	18.036	0.2945	0.4008	0.00398	0.82	0.658	55.1	0.74	2.09
2670274.	392812.	435773.	0.609	0.689	0.0319	16.223	0.2867	0.4014	0.00368	0.82	0.637	56.5	0.73	2.11
2574312.	415744.	452062.	0.611	0.689	0.0267	14.534	0.2808	0.4018	0.00343	0.82	0.618	58.1	0.71	2.13
2482911.	455451.	487370.	0.613	0.689	0.0230	12.477	0.2763	0.4012	0.00321	0.81	0.611	60.6	0.70	2.11
2400459.	494862.	523021.	0.619	0.689	0.0197	10.823	0.2754	0.4006	0.00303	0.81	0.607	63.1	0.70	2.09
HEAT BALANCE, 0.17 TEST VOLTAGE, 26.5 HEAT INPUT/UNIT AREA, 0.834 ID, 0.335 OD, 0.375 LENGTH, 24.0														
3906816.	104202.	186524.	1.029	0.698	0.1293	104.000	0.4542	0.4036	0.00650	1.07	0.618	42.3	0.71	2.75
3944895.	178176.	278062.	0.822	0.684	0.1086	60.734	0.4009	0.4119	0.00549	0.97	0.613	48.7	0.68	2.46
3925477.	254089.	360103.	0.721	0.687	0.0903	40.997	0.3663	0.4055	0.00491	0.91	0.621	54.0	0.69	2.24
3870220.	326373.	430995.	0.668	0.689	0.0760	30.572	0.3420	0.4018	0.00448	0.88	0.626	58.3	0.70	2.12
3833916.	373048.	478730.	0.651	0.689	0.0705	26.020	0.3325	0.3976	0.00432	0.86	0.633	60.8	0.70	2.04
3794856.	453817.	567793.	0.639	0.687	0.0672	20.186	0.3244	0.3822	0.00421	0.83	0.657	65.0	0.74	1.87
3752632.	451251.	552875.	0.629	0.688	0.0601	20.273	0.3173	0.3869	0.00403	0.84	0.640	64.8	0.72	1.92
3660610.	485954.	574214.	0.618	0.688	0.0500	18.069	0.3054	0.3874	0.00375	0.84	0.627	66.6	0.71	1.93
3562154.	513298.	589212.	0.612	0.688	0.0418	16.455	0.2960	0.3893	0.00349	0.84	0.611	68.1	0.70	1.95
3462684.	548725.	615165.	0.611	0.689	0.0355	14.678	0.2885	0.3894	0.00328	0.84	0.600	70.1	0.69	1.95
3362983.	592300.	651435.	0.611	0.688	0.0306	12.861	0.2826	0.3881	0.00309	0.83	0.594	72.5	0.68	1.94
3267228.	657345.	711627.	0.613	0.688	0.0272	10.825	0.2778	0.3835	0.00291	0.82	0.597	75.8	0.69	1.89
HEAT BALANCE, -0.02 TEST VOLTAGE, 17.7 HEAT INPUT/UNIT AREA, 0.549 ID, 0.335 OD, 0.375 LENGTH, 24.0														
602353.	167793.	173722.	0.629	0.689	0.0172	7.263	0.2853	0.4004	0.00536	0.66	0.966	25.4	1.13	2.07
566231.	141583.	144976.	0.639	0.686	0.0132	8.497	0.2901	0.4074	0.00494	0.56	0.855	24.2	1.03	2.31
535388.	143602.	143616.	0.650	0.685	0.0081	7.771	0.3004	0.4094	0.00455	0.51	0.820	24.8	1.01	2.38
507623.	126430.	126441.	0.659	0.682	0.0021	8.550	0.3123	0.4127	0.00433	0.55	0.758	24.1	0.95	2.57
494758.	138940.	138951.	0.663	0.683	0.0002	7.328	0.3184	0.4134	0.00410	0.53	0.763	25.2	0.95	2.53
482689.	130600.	130700.	0.667	0.681	0.0002	7.508	0.3244	0.4123	0.00402	0.55	0.741	25.0	0.93	2.59
471910.	135851.	135860.	0.670	0.681	0.0002	7.097	0.3305	0.4122	0.00390	0.55	0.735	25.4	0.93	2.73
451964.	120578.	120587.	0.676	0.693	0.0002	7.648	0.3430	0.4058	0.00387	0.58	0.701	24.8	0.90	2.72
433738.	129728.	129739.	0.680	0.692	0.0001	6.602	0.3555	0.4063	0.00358	0.57	0.698	25.9	0.90	2.72
417425.	121053.	121065.	0.683	0.696	0.0001	6.806	0.3664	0.4031	0.00350	0.60	0.676	25.6	0.88	2.82
403045.	131782.	131796.	0.685	0.697	0.0001	5.800	0.3745	0.4034	0.00329	0.59	0.685	26.9	0.88	2.79
389967.	128558.	128572.	0.687	0.695	0.0001	5.741	0.3823	0.4031	0.00322	0.60	0.669	26.9	0.87	2.86
HEAT BALANCE, -0.10 TEST VOLTAGE, 23.8 HEAT INPUT/UNIT AREA, 0.693 ID, 0.335 OD, 0.375 LENGTH, 24.0														
1237381.	276244.	427895.	0.792	0.649	0.3479	9.190	0.3958	0.3954	0.00602	0.63	0.814	43.9	0.92	1.91
1250367.	250125.	359449.	0.726	0.660	0.2593	10.576	0.3829	0.4096	0.00538	0.65	0.748	42.0	0.84	2.08
1249613.	239433.	321666.	0.674	0.666	0.2011	11.351	0.3710	0.4199	0.00487	0.67	0.702	41.2	0.80	2.22
1234422.	238984.	303479.	0.639	0.668	0.1623	11.282	0.3620	0.4203	0.00446	0.68	0.671	41.2	0.78	2.29
1230191.	249677.	309274.	0.627	0.668	0.1498	10.609	0.3592	0.4203	0.00430	0.68	0.667	41.9	0.78	2.29
1220490.	240053.	291611.	0.617	0.669	0.1352	11.048	0.3568	0.4209	0.00412	0.69	0.644	41.3	0.76	2.36
1209632.	255000.	303474.	0.610	0.669	0.1271	10.143	0.3547	0.4207	0.00398	0.69	0.644	42.4	0.76	2.34
1185481.	258604.	296216.	0.600	0.670	0.1105	9.740	0.3513	0.4213	0.00369	0.70	0.621	42.8	0.74	2.39
1159189.	274451.	276369.	0.594	0.670	0.0139	8.797	0.3490	0.4214	0.00345	0.69	0.611	44.0	0.79	2.44
1131807.	277384.	277407.	0.592	0.670	0.0002	8.425	0.3474	0.4220	0.00323	0.70	0.591	44.5	0.76	2.50
1105151.	298839.	298863.	0.594	0.670	0.0002	7.439	0.3479	0.4218	0.00304	0.70	0.590	46.2	0.76	2.48
1080150.	307756.	307779.	0.598	0.670	0.0002	6.958	0.3509	0.4221	0.00289	0.70	0.581	47.1	0.74	2.50
HEAT BALANCE, -0.01 TEST VOLTAGE, 20.0 HEAT INPUT/UNIT AREA, 0.703 ID, 0.335 OD, 0.375 LENGTH, 24.0														
2354737.	498359.	802370.	0.855	0.643	0.2773	9.814	0.4199	0.3340	0.00594	0.64	0.839	63.8	1.01	1.44
2367831.	415017.	625235.	0.769	0.664	0.2067	12.421	0.3389	0.3608	0.00539	0.68	0.754	58.9	0.88	1.65
2363399.	419391.	590884.	0.707	0.669	0.1659	12.285	0.3406	0.3698	0.00496	0.69	0.728	58.7	0.84	1.72
2344359.	405585.	544154.	0.663	0.675	0.1327	12.604	0.3447	0.3799	0.00455	0.70	0.693	57.8	0.80	1.82
2330517.	431408.	559724.	0.647	0.674	0.1220	11.729	0.3576	0.3788	0.00430	0.70	0.693	58.9	0.80	1.81
2314195.	439322.	557034.	0.634	0.675	0.1111	11.390	0.3511	0.3806	0.00423	0.70	0.684	59.2	0.80	1.83
2295734.	451775.	561136.	0.623	0.675	0.1019	10.906	0.3452	0.3815	0.00409	0.70	0.679	59.8	0.79	1.84
2253072.	444016.	531916.	0.607	0.679	0.0842	10.923	0.3345	0.3895	0.00378	0.72	0.649	59.5	0.75	1.93
2205337.	490860.	570087.	0.597	0.678	0.0734	9.408	0.3256	0.3868	0.00354	0.71	0.650	61.9	0.76	1.90
2155072.	510856.	576634.	0.591	0.679	0.0635	8.706	0.3181	0.3891	0.00332	0.71	0.638	63.1	0.75	1.93
2106278.	573895.	631759.	0.591	0.677	0.0576	7.295	0.3144	0.3840	0.00316	0.70	0.653	66.4	0.78	1.87
2058194.	616194.	673048.	0.593	0.676	0.0521	6.450	0.3129	0.3826	0.00308	0.69	0.660	68.6	0.79	1.85

TABLE IV. - Continued. UNIFORMLY

(d) Test section 4; tube inside diameter, 0.220 inch; tube outside

EL	P8	T8	ROB	VFLOC	M	X2	TO	TW	H	H/HHK	H/HM-W	H/HF	TW/TB	THETA	ROFM
RUN	2-1005	WEIGHT FLOW,	0.0950	HEAT INPUT,	33.75	INLET BULK TEMP,	53.3	OUTLET BULK TEMP,	127.2	PLOT CH 3					
2.00	298.9	61.2	3.063	117.5	0.054	0.0736	724.	623.	0.00480	1.80	0.93	3.40	10.18	0.007	1.42
3.50	296.6	64.3	2.455	146.6	0.085	0.1514	944.	853.	0.00347	1.00	0.57	2.67	13.26	0.001	0.67
5.00	293.2	66.4	1.883	191.2	0.123	0.2715	951.	860.	0.00345	0.82	0.55	2.18	12.95	-0.002	0.40
6.50	289.2	68.9	1.436	250.6	0.162	0.4168	867.	774.	0.00386	0.82	0.66	1.83	11.23	-0.006	0.29
7.25	285.7	70.6	1.259	285.9	0.182	0.4905	811.	715.	0.00421	0.85	0.75	1.69	10.12	-0.009	0.26
8.00	282.4	72.8	1.110	324.2	0.202	0.5605	805.	708.	0.00427	0.82	0.81	1.56	9.73	-0.013	0.23
8.75	278.1	75.3	0.983	366.0	0.222	0.6254	758.	659.	0.00463	0.86	0.89	1.48	8.75	-0.019	0.22
10.00	272.3	80.5	0.818	439.7	0.254	0.7172	730.	630.	0.00491	0.86	0.98	1.34	7.82	-0.030	0.19
11.50	264.3	88.0	0.670	536.9	0.291	0.8012	701.	599.	0.00527	0.86	1.07	1.23	6.80	-0.048	0.18
13.00	255.4	96.6	0.559	643.7	0.329	0.8611	695.	593.	0.00543	0.83	1.11	1.12	6.14	-0.067	0.16
14.50	246.2	105.9	0.474	759.6	0.367	0.9028	687.	584.	0.00563	0.82	1.14	1.05	5.51	-0.090	0.15
16.00	235.9	115.3	0.406	885.4	0.411	0.9313	684.	580.	0.00579	0.80	1.14	1.00	5.03	-0.114	0.13
RUN	3-1022	WEIGHT FLOW,	0.1230	HEAT INPUT,	35.80	INLET BULK TEMP,	55.0	OUTLET BULK TEMP,	102.2	PLOT CH 4					
2.00	298.1	61.1	3.069	151.8	0.069	0.0729	699.	591.	0.00540	1.67	0.83	3.02	9.67	0.008	1.48
3.50	294.7	63.8	2.567	181.5	0.101	0.1328	936.	839.	0.00375	0.92	0.52	2.41	13.15	0.002	0.75
5.00	290.5	65.4	2.068	225.3	0.142	0.2238	953.	856.	0.00368	0.76	0.47	2.05	13.08	-0.001	0.47
6.50	286.0	67.1	1.647	283.0	0.185	0.3366	848.	748.	0.00424	0.78	0.53	1.78	11.15	-0.004	0.36
7.25	282.2	68.0	1.465	318.0	0.208	0.3983	808.	706.	0.00452	0.79	0.59	1.66	10.38	-0.006	0.32
8.00	279.0	69.3	1.310	355.7	0.231	0.4599	794.	690.	0.00463	0.78	0.64	1.55	9.97	-0.008	0.28
8.75	274.9	70.7	1.172	397.5	0.254	0.5204	741.	634.	0.00509	0.82	0.71	1.48	8.97	-0.012	0.27
10.00	268.5	73.8	0.985	473.1	0.292	0.6135	709.	601.	0.00544	0.83	0.80	1.36	8.13	-0.019	0.23
11.50	260.0	78.6	0.810	575.2	0.338	0.7091	672.	562.	0.00591	0.84	0.90	1.25	7.15	-0.031	0.21
13.00	249.8	84.3	0.674	691.7	0.386	0.7851	662.	551.	0.00612	0.82	0.97	1.15	6.53	-0.046	0.18
14.50	236.9	90.8	0.562	828.7	0.441	0.8436	648.	536.	0.00640	0.81	1.03	1.08	5.91	-0.063	0.16
16.00	220.2	97.7	0.467	998.7	0.507	0.8882	640.	528.	0.00662	0.79	1.08	1.02	5.41	-0.084	0.15
RUN	4-1007	WEIGHT FLOW,	0.1210	HEAT INPUT,	17.52	INLET BULK TEMP,	52.9	OUTLET BULK TEMP,	70.4	PLOT CH 5					
2.00	283.9	56.7	3.514	130.4	0.050	0.0361	397.	336.	0.00500	1.99	0.74	2.55	5.93	0.028	2.63
3.50	282.4	58.9	3.283	139.6	0.059	0.0515	495.	436.	0.00373	1.32	0.55	1.96	7.40	0.015	2.04
5.00	280.4	60.8	3.038	150.9	0.070	0.0718	576.	521.	0.00307	0.98	0.43	1.67	8.57	0.008	1.54
6.50	278.3	62.2	2.784	164.7	0.085	0.0981	548.	490.	0.00330	0.97	0.39	1.62	7.88	0.005	1.30
7.25	276.7	62.7	2.652	172.8	0.095	0.1140	542.	485.	0.00334	0.94	0.36	1.56	7.73	0.004	1.18
8.00	275.3	63.1	2.520	181.9	0.105	0.1320	539.	481.	0.00337	0.90	0.33	1.53	7.62	0.003	1.06
8.75	273.6	63.4	2.386	192.1	0.116	0.1524	496.	437.	0.00377	0.99	0.32	1.58	6.89	0.002	1.02
10.00	271.0	63.9	2.171	211.1	0.134	0.1902	480.	421.	0.00394	0.98	0.33	1.53	6.58	0.000	0.88
11.50	267.7	64.5	1.930	237.5	0.157	0.2408	451.	391.	0.00429	1.01	0.34	1.49	6.06	-0.002	0.76
13.00	264.1	65.1	1.710	268.1	0.181	0.2976	440.	380.	0.00444	0.97	0.35	1.41	5.85	-0.004	0.65
14.50	260.3	65.7	1.512	303.1	0.206	0.3589	427.	367.	0.00465	0.95	0.39	1.33	5.58	-0.007	0.56
16.00	256.4	66.6	1.340	342.1	0.231	0.4222	413.	352.	0.00490	0.94	0.45	1.28	5.29	-0.011	0.50
RUN	5-1006	WEIGHT FLOW,	0.1730	HEAT INPUT,	17.52	INLET BULK TEMP,	56.6	OUTLET BULK TEMP,	64.4	PLOT CH 6					
2.00	257.9	58.6	3.249	201.8	0.087	0.0498	264.	200.	0.00985	2.74	0.70	3.13	3.41	0.034	2.66
3.50	255.5	59.8	3.072	213.3	0.100	0.0630	343.	280.	0.00634	1.80	0.48	2.28	4.69	0.016	2.13
5.00	252.7	60.7	2.888	226.9	0.115	0.0791	432.	372.	0.00452	1.15	0.36	1.68	6.12	0.008	1.65
6.50	249.9	61.4	2.697	243.0	0.134	0.0986	486.	426.	0.00387	0.89	0.29	1.44	6.94	0.004	1.32
7.25	247.7	61.7	2.597	252.3	0.145	0.1100	499.	440.	0.00373	0.83	0.26	1.37	7.14	0.003	1.19
8.00	245.9	61.9	2.497	262.5	0.158	0.1227	503.	444.	0.00370	0.79	0.23	1.33	7.17	0.003	1.09
8.75	243.8	62.0	2.395	273.7	0.171	0.1365	456.	396.	0.00422	0.91	0.23	1.42	6.39	0.002	1.09
10.00	240.5	62.1	2.228	294.2	0.192	0.1618	447.	387.	0.00433	0.89	0.22	1.38	6.23	0.002	0.96
11.50	236.4	62.3	2.034	322.1	0.219	0.1953	427.	366.	0.00463	0.91	0.23	1.37	5.88	0.001	0.86
13.00	232.2	62.4	1.851	354.0	0.248	0.2325	415.	354.	0.00482	0.90	0.23	1.33	5.68	-0.000	0.76
14.50	227.7	62.4	1.678	390.6	0.280	0.2736	401.	340.	0.00506	0.90	0.24	1.30	5.45	-0.001	0.67
16.00	222.7	62.4	1.516	432.4	0.313	0.3183	388.	327.	0.00530	0.91	0.27	1.27	5.24	-0.002	0.60
RUN	8-1044	WEIGHT FLOW,	0.0900	HEAT INPUT,	9.43	INLET BULK TEMP,	54.5	OUTLET BULK TEMP,	65.5	PLOT CH 9					
2.00	267.6	57.0	3.449	98.9	0.039	0.0380	289.	251.	0.00388	2.00	0.57	2.37	4.41	0.035	2.77
3.50	267.2	58.6	3.279	104.0	0.044	0.0492	348.	311.	0.00299	1.47	0.46	1.89	5.31	0.021	2.33
5.00	266.8	59.9	3.103	109.9	0.050	0.0629	381.	345.	0.00266	1.22	0.39	1.65	5.76	0.014	1.99
6.50	266.3	61.0	2.922	116.7	0.058	0.0795	368.	332.	0.00280	1.22	0.36	1.64	5.44	0.010	1.79
7.25	265.7	61.5	2.829	120.5	0.062	0.0891	397.	361.	0.00253	1.05	0.37	1.48	5.88	0.008	1.60
8.00	265.2	61.9	2.734	124.7	0.067	0.0996	408.	372.	0.00245	0.97	0.30	1.41	6.31	0.006	1.47
8.75	264.6	62.2	2.639	129.2	0.072	0.1112	391.	355.	0.00259	1.01	0.29	1.44	5.70	0.005	1.41
10.00	263.5	62.7	2.478	137.6	0.082	0.1332	393.	357.	0.00258	0.95	0.25	1.36	5.69	0.003	1.25
11.50	262.3	63.2	2.286	149.1	0.094	0.1638	375.	339.	0.00275	0.97	0.25	1.35	5.36	0.002	1.11
13.00	261.0	63.6	2.103	162.1	0.105	0.1977	372.	336.	0.00278	0.92	0.25	1.28	5.28	-0.000	0.97
14.50	259.5	64.0	1.931	176.6	0.118	0.2347	362.	325.	0.00290	0.91	0.25	1.25	5.08	-0.002	0.87
16.00	258.1	64.4	1.770	192.6	0.131	0.2750	351.	314.	0.00303	0.90	0.26	1.21	4.88	-0.004	0.78
RUN	9-1043	WEIGHT FLOW,	0.1260	HEAT INPUT,	9.48	INLET BULK TEMP,	50.7	OUTLET BULK TEMP,	61.8	PLOT CH *					
2.00	240.5	52.9	3.742	127.6	0.045	0.0206	200.	164.	0.00681	2.60	0.76	2.84	3.10	0.088	3.46
3.50	239.6	54.4	3.626	131.6	0.049	0.0254	218.	182.	0.00592	2.37	0.65	2.64	3.35	0.065	3.24
5.00	238.5	55.7	3.506	136.1	0.053	0.0311	232.	197.	0.00537	2.18	0.57	2.46	3.53	0.049	3.02
6.50	237.4	56.9	3.383	141.1	0.058	0.0377	236.	201.	0.00527	2.10	0.52	2.42	3.53	0.039	2.84
7.25	236.5	57.4	3.319	143.8	0.061	0.0414	281.	247.	0.00402	1.67	0.43	2.03	4.2		

HEATED SUPERCRITICAL PRESSURE HUNS

diameter, 0.251 inch; heated tube length, 18 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VIS-RAT	PHI-B	PHI-F	EFLUX	UQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.01 TEST VOLTAGE, 48.3 HEAT INPUT/UNIT AREA, 2.712 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1778137.	80346.	708457.	1.620	0.683	2.0823	60.800	0.4327	0.4133	0.02036	2.70	1.026	77.3	0.66	2.23
2456499.	59569.	332212.	2.472	0.694	0.8543	114.633	0.5890	0.4040	0.01611	2.74	0.889	67.8	0.72	2.69
3107292.	75567.	255719.	2.147	0.694	0.4377	114.011	0.5963	0.4040	0.01282	2.74	0.877	68.6	0.85	2.78
3541967.	114756.	262397.	1.374	0.693	0.2572	84.411	0.5131	0.4070	0.01034	2.72	0.902	73.6	0.97	2.69
3678557.	148499.	290800.	1.087	0.679	0.2048	68.009	0.4580	0.4130	0.00944	2.71	0.919	77.6	1.00	2.62
3762291.	167912.	290396.	0.905	0.680	0.1597	61.171	0.4316	0.4131	0.00854	2.71	0.910	79.1	1.02	2.62
3806032.	207145.	322825.	0.788	0.682	0.1300	49.341	0.4017	0.4145	0.00798	2.70	0.928	83.4	1.04	2.55
3792766.	257851.	353019.	0.678	0.683	0.0918	38.742	0.3635	0.4143	0.00688	2.70	0.918	88.2	1.05	2.50
3691345.	323764.	398933.	0.620	0.684	0.0628	29.232	0.3313	0.4126	0.00599	2.69	0.901	94.6	1.04	2.45
3540486.	373244.	429521.	0.601	0.684	0.0438	23.790	0.3093	0.4125	0.00524	2.69	0.861	99.6	1.01	2.45
3370060.	424740.	467264.	0.600	0.684	0.0318	19.402	0.2944	0.4123	0.00466	2.69	0.827	105.1	0.98	2.45
3207499.	467843.	499711.	0.609	0.684	0.0238	16.378	0.2888	0.4125	0.00420	2.69	0.794	110.0	0.95	2.47
HEAT BALANCE, 0.06 TEST VOLTAGE, 49.8 HEAT INPUT/UNIT AREA, 2.878 ID, 0.220 OD, 0.251 LENGTH, 18.0														
2294860.	112366.	980663.	1.617	0.684	2.1581	55.694	0.4317	0.4113	0.01697	2.86	0.909	97.6	0.59	2.17
3013735.	75272.	466116.	2.290	0.695	0.9844	111.184	0.5602	0.4040	0.01385	2.90	0.775	83.7	0.60	2.64
3765806.	89023.	357467.	2.353	0.694	0.5491	117.443	0.6078	0.4040	0.01155	2.91	0.764	83.9	0.70	2.75
4353479.	137193.	380116.	1.863	0.685	0.3532	87.660	0.5736	0.4101	0.00976	2.89	0.796	90.9	0.81	2.64
4581327.	167251.	396831.	1.494	0.680	0.2854	75.517	0.5306	0.4133	0.00900	2.88	0.813	94.2	0.85	2.59
4751575.	190876.	396690.	1.207	0.681	0.2295	68.249	0.4890	0.4137	0.00826	2.88	0.817	96.1	0.88	2.57
4880400.	238211.	440546.	1.010	0.683	0.1920	55.290	0.4540	0.4140	0.00773	2.87	0.846	101.3	0.92	2.48
4995122.	298734.	473498.	0.811	0.684	0.1396	44.407	0.4076	0.4119	0.00687	2.86	0.855	106.4	0.95	2.41
5009371.	383893.	530814.	0.688	0.685	0.0979	33.854	0.3659	0.4094	0.00606	2.86	0.862	113.5	0.97	2.33
4931219.	450854.	566402.	0.631	0.685	0.0687	27.868	0.3352	0.4088	0.00535	2.85	0.841	118.8	0.96	2.32
4601158.	523913.	614929.	0.608	0.686	0.0490	22.855	0.3123	0.4079	0.00480	2.85	0.823	124.8	0.95	2.30
4648260.	585998.	659446.	0.604	0.686	0.0347	19.251	0.2945	0.4073	0.00433	2.85	0.801	130.5	0.93	2.29
HEAT BALANCE, -0.08 TEST VOLTAGE, 34.5 HEAT INPUT/UNIT AREA, 1.410 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1721610.	217853.	2120227.	1.357	0.667	5.4558	19.376	0.3465	0.3496	0.01124	1.40	0.619	123.0	0.37	1.72
1989959.	156067.	1501967.	1.488	0.683	3.4189	33.411	0.3902	0.3894	0.01019	1.41	0.538	110.1	0.33	1.87
2304201.	127529.	1101243.	1.697	0.686	2.2678	48.482	0.4440	0.4063	0.00925	1.41	0.488	102.3	0.32	2.05
2659249.	150933.	1051986.	2.021	0.686	1.7189	46.625	0.5090	0.4044	0.00880	1.41	0.499	106.7	0.36	2.02
2852113.	159827.	1005771.	2.304	0.686	1.4832	47.071	0.5523	0.4040	0.00852	1.41	0.502	107.7	0.38	2.03
3050893.	168904.	950203.	2.702	0.687	1.2774	47.535	0.6040	0.4038	0.00822	1.41	0.504	108.4	0.40	2.03
3254790.	204477.	1029932.	3.029	0.684	1.1513	41.137	0.6463	0.3907	0.00812	1.41	0.531	114.1	0.45	1.92
3583658.	235220.	995375.	2.897	0.683	0.9192	38.725	0.6537	0.3854	0.00766	1.41	0.545	116.7	0.49	1.87
3944569.	290360.	1013040.	2.729	0.681	0.7234	33.358	0.6547	0.3756	0.00720	1.40	0.572	121.6	0.55	1.79
4263186.	336427.	987574.	2.429	0.680	0.5621	30.877	0.6368	0.3719	0.00665	1.40	0.586	123.8	0.59	1.76
4532531.	394341.	987938.	1.895	0.679	0.4427	27.724	0.5842	0.3673	0.00617	1.40	0.604	126.7	0.64	1.71
4748743.	463712.	1009167.	1.452	0.676	0.3532	24.396	0.5287	0.3604	0.00573	1.40	0.625	130.2	0.68	1.65
HEAT BALANCE, -0.15 TEST VOLTAGE, 34.5 HEAT INPUT/UNIT AREA, 1.413 ID, 0.220 OD, 0.251 LENGTH, 18.0														
2915109.	644792.	4408294.	1.557	0.617	4.9958	9.727	0.4018	0.2953	0.00849	1.39	0.573	215.8	0.47	1.55
3241298.	413519.	3105879.	1.743	0.654	3.3564	18.260	0.4442	0.3217	0.00815	1.40	0.501	184.0	0.38	1.57
3606500.	287111.	2166306.	2.022	0.679	2.3285	13.020	0.4962	0.3667	0.00748	1.41	0.439	161.1	0.33	1.73
4006605.	247817.	1712182.	2.513	0.685	1.7395	11.832	0.5665	0.3853	0.00690	1.41	0.409	151.4	0.31	1.86
4225160.	242878.	1577767.	2.975	0.686	1.5271	10.443	0.6188	0.3899	0.00669	1.41	0.402	149.2	0.32	1.90
4448083.	247817.	1498217.	3.597	0.686	1.3574	8.6734	0.6803	0.3910	0.00650	1.41	0.402	148.8	0.32	1.92
4679382.	303159.	1659194.	4.211	0.683	1.2815	38.466	0.7371	0.3750	0.00655	1.41	0.429	157.7	0.37	1.79
5061197.	332369.	1607769.	4.353	0.682	1.0764	37.686	0.7652	0.3716	0.00629	1.41	0.437	159.7	0.39	1.76
5503352.	388515.	1617502.	4.220	0.680	0.8932	34.718	0.7732	0.3637	0.00604	1.41	0.455	164.4	0.43	1.69
5920401.	440813.	1578020.	4.374	0.678	0.7378	32.683	0.7990	0.3574	0.00573	1.40	0.473	167.3	0.47	1.64
6312797.	506408.	1605507.	3.971	0.676	0.6127	30.076	0.7805	0.3499	0.00545	1.40	0.480	170.7	0.51	1.59
6677882.	581345.	1623529.	3.068	0.673	0.5095	27.479	0.7127	0.3427	0.00518	1.40	0.506	174.2	0.55	1.53
HEAT BALANCE, -0.05 TEST VOLTAGE, 24.1 HEAT INPUT/UNIT AREA, 0.759 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1336670.	238542.	1991309.	1.403	0.638	5.8517	12.894	0.3595	0.3091	0.00878	0.75	0.475	112.6	0.33	1.62
1485731.	182111.	1563661.	1.514	0.663	4.1244	19.548	0.3933	0.3366	0.00837	0.76	0.436	102.6	0.30	1.65
1652455.	164115.	1325617.	1.673	0.672	3.0984	24.522	0.4329	0.3542	0.00791	0.76	0.414	98.5	0.29	1.69
1836124.	183351.	1292634.	1.889	0.669	2.9168	24.071	0.4786	0.3491	0.00764	0.76	0.421	101.4	0.32	1.65
1934734.	166464.	1137537.	2.036	0.676	2.1551	28.402	0.5051	0.3629	0.00734	0.76	0.403	97.5	0.31	1.71
2036685.	164234.	1060942.	2.227	0.678	1.8989	30.447	0.5353	0.3681	0.00712	0.76	0.398	96.4	0.31	1.74
2142379.	181932.	1082251.	2.498	0.675	1.7396	28.586	0.5721	0.3600	0.00702	0.76	0.408	99.0	0.34	1.69
2324458.	190871.	11013515.	3.107	0.676	1.4393	29.542	0.6437	0.3613	0.00669	0.76	0.408	99.0	0.35	1.69
2544208.	221957.	1011707.	3.367	0.672	1.1860	27.438	0.6844	0.3524	0.00639	0.76	0.423	102.0	0.39	1.63
2753007.	242624.	965373.	3.100	0.672	0.9668	27.064	0.6773	0.3510	0.00602	0.76	0.429	102.8	0.42	1.61
2945739.	274941.	957279.	2.980	0.669	0.8049	25.321	0.6786	0.3458	0.00571	0.76	0.441	104.8	0.45	1.57
3120574.	312911.	959369.	2.762	0.666	0.6746	23.337	0.6677	0.3403	0.00541	0.76	0.454	107.0	0.48	1.52
HEAT BALANCE, -0.24 TEST VOLTAGE, 24.1 HEAT INPUT/UNIT AREA, 0.761 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1551880.	528353.	4081999.	1.283	0.601	12.1790	6.272	0.3104	0.2907	0.00705	0.76	0.448	175.7	0.32	1.70
1673976.	461580.	3734147.	1.335	0.611	9.4744	7.963	0.3295	0.2898	0.00709	0.76	0.419	169.0	0.30	1.65
1808572.	421117.	3450972.	1.396	0.619	7.5405	9.404	0.3511	0.2907	0.00706	0.76	0.403	164.5	0.30	1.62
1956482.	417086.	3313144.	1.479	0.621	6.2212	10.188	0.3757	0.2910	0.00698	0.76	0.401	164.7	0.31	1.58
2036777.	315966.	2746880.	1.532	0.642	5.1307	14.775	0.3896	0.3028	0.00674	0.76	0.372	149.3	0.27	1.58
2120633.	288919.	2532301.	1.594	0.651	4.5312	17.068	0.4046	0.3114	0.00684	0.76	0.362	144.7	0.26	1.58
2208908.	269416.	2350551.	1.668	0.657	4.0315	19.282	0.4210	0.3189	0.00675	0.76	0.354	141.1	0.26	1.58
2365365.	233981.	2021479.	1.822	0.668	3.2932	24.321	0.4517	0.3357	0.00652	0.76	0.337	134.0	0.25	1.62
2567501.	238797.	1903378.	2.075	0.669	2.7588	25.850	0.4951	0.3377	0.00634	0.76	0.336	134.0	0.26	1.61
2784966.	257515.	1958243.	2.462	0.668	2.3548	25.801	0.5500	0.3339	0.00613	0.76	0.341	136.3	0.28	1.57
3018504.	280854.	1823550.	3.199	0.665	2.0137	25.427	0.6312	0.3293	0.00602	0.76	0.348	138.7	0.30	1.54
3266252.	310117.	1802257.	4.488	0.663	1.7228	24.693	0.7573	0.3244	0.00583	0.76	0.356	141.4		

TABLE IV. - Continued. UNIFORMLY

(d) Continued. Test section 4; tube inside diameter, 0.220 inch; tube outside

EL	PB	T8	ROB	VELOC	M	X2	TG	TW	H	H/HHK	H/HFW	H/HF	TW/T8	THETA	ROFM
RUN 10-1042 WEIGHT FLOW, 0.1650 HEAT INPUT, 9.64 INLET BULK TEMP, 49.5 OUTLET BULK TEMP, 60.5 PLOT CH A															
2.00	237.4	51.3	3.845	162.6	0.055	0.0166	156.	116.	0.01201	2.57	0.96	2.70	2.25	0.174	3.75
3.50	236.2	52.6	3.757	166.4	0.056	0.0197	155.	115.	0.01238	2.64	0.93	2.77	2.18	0.158	3.65
5.00	235.0	53.8	3.667	170.5	0.062	0.0232	168.	128.	0.01034	2.53	0.78	2.70	2.39	0.116	3.49
6.50	233.9	54.9	3.574	174.9	0.066	0.0272	178.	139.	0.00923	2.43	0.68	2.62	2.53	0.090	3.34
7.25	233.0	55.4	3.526	177.3	0.069	0.0294	211.	174.	0.00651	2.06	0.53	2.29	3.15	0.059	3.13
8.00	232.3	55.8	3.478	179.7	0.071	0.0318	189.	150.	0.00820	2.31	0.59	2.52	2.69	0.068	3.17
8.75	231.5	56.3	3.429	182.3	0.074	0.0342	203.	166.	0.00708	2.14	0.52	2.37	2.94	0.054	3.04
10.00	259.9	57.3	3.401	183.8	0.074	0.0399	208.	171.	0.00680	1.87	0.50	2.06	2.99	0.055	2.99
11.50	257.9	58.1	3.302	189.3	0.080	0.0460	204.	167.	0.00713	1.89	0.49	2.09	2.87	0.049	2.88
13.00	226.0	58.5	3.136	199.3	0.092	0.0515	219.	182.	0.00628	1.89	0.40	2.16	3.11	0.029	2.58
14.50	223.6	59.0	3.027	206.5	0.100	0.0591	234.	197.	0.00562	1.71	0.35	2.01	3.34	0.021	2.37
16.00	220.9	59.5	2.913	214.6	0.110	0.0677	251.	215.	0.00500	1.53	0.30	1.85	3.61	0.015	2.15
RUN 11-1026 WEIGHT FLOW, 0.0930 HEAT INPUT, 35.78 INLET BULK TEMP, 56.3 OUTLET BULK TEMP, 142.2 PLOT CH B															
2.00	412.3	65.2	3.003	117.3	0.052	0.1056	935.	848.	0.00370	1.26	0.87	2.61	13.00	0.006	1.14
3.50	410.0	69.7	2.428	145.1	0.076	0.2039	1076.	989.	0.00318	0.86	0.66	2.14	14.19	0.001	0.61
5.00	406.9	73.6	1.917	183.7	0.104	0.3361	949.	862.	0.00368	0.87	0.70	1.87	11.71	-0.005	0.44
6.50	403.9	78.2	1.523	231.3	0.130	0.4786	864.	775.	0.00414	0.88	0.78	1.63	9.92	-0.012	0.34
7.25	401.7	80.9	1.365	258.2	0.143	0.5462	833.	742.	0.00436	0.88	0.83	1.52	9.17	-0.017	0.31
8.00	399.6	84.0	1.230	286.3	0.156	0.6081	824.	732.	0.00444	0.86	0.86	1.42	8.72	-0.022	0.29
8.75	397.1	87.5	1.115	316.0	0.168	0.6639	780.	686.	0.00480	0.88	0.92	1.35	7.84	-0.030	0.28
10.00	393.1	94.0	0.958	367.7	0.187	0.7421	755.	660.	0.00506	0.87	0.97	1.24	7.32	-0.043	0.25
11.50	388.1	102.8	0.814	432.9	0.209	0.8137	728.	632.	0.00541	0.86	1.03	1.15	6.14	-0.064	0.23
13.00	382.8	112.2	0.705	500.0	0.231	0.8647	724.	627.	0.00555	0.84	1.04	1.07	5.59	-0.084	0.22
14.50	376.5	122.0	0.619	568.9	0.254	0.9006	716.	619.	0.00575	0.82	1.04	1.02	5.07	-0.107	0.21
16.00	369.7	132.1	0.550	640.8	0.277	0.9265	715.	618.	0.00588	0.81	1.03	0.97	4.68	-0.131	0.19
RUN 14-1025 WEIGHT FLOW, 0.1230 HEAT INPUT, 35.88 INLET BULK TEMP, 53.0 OUTLET BULK TEMP, 111.8 PLOT CH E															
2.00	419.2	61.2	3.408	136.7	0.052	0.0604	824.	723.	0.00437	1.35	0.91	2.33	11.82	0.014	1.80
3.50	417.0	65.6	2.975	156.6	0.070	0.1105	999.	902.	0.00349	0.93	0.67	2.03	13.74	0.006	1.07
5.00	414.3	69.1	2.538	183.6	0.094	0.1826	904.	807.	0.00394	0.91	0.60	1.87	11.68	0.002	0.78
6.50	411.6	72.0	2.130	218.7	0.121	0.2767	824.	722.	0.00444	0.89	0.61	1.67	10.03	-0.003	0.60
7.25	409.4	73.5	1.947	239.3	0.134	0.3283	793.	689.	0.00468	0.89	0.63	1.59	9.38	-0.005	0.54
8.00	407.6	75.1	1.781	261.6	0.148	0.3819	783.	679.	0.00477	0.86	0.64	1.50	9.04	-0.008	0.47
8.75	405.1	76.7	1.630	285.9	0.162	0.4363	730.	623.	0.00526	0.90	0.67	1.45	8.12	-0.012	0.45
10.00	400.5	79.8	1.411	330.2	0.185	0.5242	703.	594.	0.00558	0.89	0.74	1.35	7.44	-0.020	0.39
11.50	395.3	84.4	1.201	387.9	0.211	0.6192	668.	557.	0.00606	0.89	0.82	1.26	6.60	-0.032	0.35
13.00	388.9	89.7	1.033	451.2	0.237	0.7001	653.	541.	0.00634	0.87	0.87	1.16	6.03	-0.045	0.31
14.50	380.3	95.7	0.894	521.3	0.263	0.7669	638.	526.	0.00664	0.85	0.91	1.10	5.49	-0.062	0.29
16.00	371.1	102.2	0.781	596.8	0.290	0.8202	630.	517.	0.00688	0.84	0.95	1.04	5.06	-0.081	0.26
RUN 16-1024 WEIGHT FLOW, 0.1740 HEAT INPUT, 35.92 INLET BULK TEMP, 50.6 OUTLET BULK TEMP, 88.8 PLOT CH G															
2.00	443.7	57.3	3.726	176.9	0.059	0.0363	704.	594.	0.00537	1.33	0.91	1.92	10.37	0.027	2.57
3.50	440.4	61.4	3.435	191.9	0.072	0.0604	853.	752.	0.00422	0.99	0.69	1.71	12.26	0.015	1.82
5.00	436.4	64.7	3.130	210.6	0.088	0.0937	825.	722.	0.00442	0.93	0.61	1.62	11.16	0.010	1.42
6.50	432.4	67.5	2.822	233.6	0.106	0.1372	765.	659.	0.00490	0.92	0.57	1.55	9.76	0.006	1.15
7.25	429.4	68.7	2.667	247.2	0.120	0.1630	730.	622.	0.00522	0.93	0.55	1.53	9.05	0.004	1.05
8.00	427.0	69.8	2.514	262.2	0.134	0.1920	732.	625.	0.00521	0.88	0.53	1.47	8.95	0.002	0.92
8.75	423.9	70.8	2.363	279.0	0.147	0.2241	676.	565.	0.00582	0.94	0.54	1.48	7.98	-0.000	0.88
10.00	419.0	72.5	2.125	310.1	0.170	0.2818	651.	538.	0.00617	0.92	0.55	1.41	7.43	-0.004	0.75
11.50	413.3	74.5	1.868	352.8	0.198	0.3558	614.	500.	0.00675	0.93	0.58	1.34	6.70	-0.010	0.65
13.00	406.9	76.7	1.641	401.6	0.227	0.4330	595.	479.	0.00712	0.90	0.61	1.25	6.25	-0.017	0.56
14.50	399.1	79.1	1.442	457.0	0.257	0.5094	571.	454.	0.00763	0.90	0.65	1.20	5.74	-0.025	0.50
16.00	390.4	81.9	1.271	516.7	0.287	0.5814	556.	438.	0.00801	0.89	0.71	1.15	5.35	-0.035	0.45
RUN 17-1011 WEIGHT FLOW, 0.1210 HEAT INPUT, 17.52 INLET BULK TEMP, 53.8 OUTLET BULK TEMP, 78.2 PLOT CH H															
2.00	410.5	58.0	3.632	126.2	0.044	0.0407	341.	279.	0.00631	1.96	0.89	2.23	4.81	0.055	3.00
3.50	409.2	60.7	3.426	133.8	0.051	0.0576	419.	359.	0.00470	1.42	0.68	1.74	5.91	0.032	2.47
5.00	407.6	63.0	3.212	142.7	0.059	0.0790	465.	426.	0.00388	1.11	0.55	1.47	6.76	0.019	1.99
6.50	405.9	65.1	2.994	153.1	0.068	0.1054	517.	458.	0.00359	0.96	0.48	1.33	7.04	0.012	1.63
7.25	404.6	66.0	2.883	159.0	0.073	0.1206	524.	465.	0.00353	0.91	0.46	1.28	7.05	0.010	1.49
8.00	403.5	66.9	2.773	165.3	0.079	0.1372	523.	465.	0.00355	0.88	0.44	1.25	6.95	0.008	1.37
8.75	402.2	67.7	2.662	172.2	0.085	0.1554	490.	431.	0.00388	0.94	0.44	1.29	6.37	0.006	1.32
10.00	400.1	68.9	2.479	184.9	0.097	0.1892	477.	417.	0.00404	0.93	0.43	1.25	6.06	0.002	1.17
11.50	397.6	70.2	2.268	202.1	0.111	0.2351	449.	389.	0.00440	0.95	0.43	1.25	5.55	-0.002	1.05
13.00	395.2	71.6	2.070	221.4	0.125	0.2844	435.	375.	0.00463	0.94	0.45	1.21	5.23	-0.007	0.93
14.50	392.4	72.9	1.888	242.8	0.139	0.3366	416.	356.	0.00496	0.94	0.46	1.19	4.88	-0.013	0.84
16.00	389.5	74.4	1.722	266.2	0.154	0.3909	406.	345.	0.00517	0.93	0.48	1.15	4.64	-0.019	0.76
RUN 19-1012 WEIGHT FLOW, 0.0920 HEAT INPUT, 17.44 INLET BULK TEMP, 56.1 OUTLET BULK TEMP, 88.3 PLOT CH J															
2.00	406.0	61.0	3.396	102.6	0.039	0.0600	502.	444.	0.00365	1.37	0.71	1.83	7.28	0.024	2.23
3.50	405.3	63.9	3.116	111.8	0.048	0.0897	582.	525.	0.00305	1.06	0.58	1.57	8.21	0.013	1.67
5.00	404.0	66.4	2.830	123.1	0.058	0.1284	590.	533.	0.00301	0.96	0.51	1.46	8.03	0.007	1.32
6.50	402.7	68.5	2.546	136.9	0.070	0.1769	558.	509.	0.00325	0.94	0.48	1.40	7.30	0.003	1.10
7.25	401.6	69.4	2.406	144.8	0.077	0.2052	559.	502.	0.00324	0.90	0.46	1.34	7.23	0.001	0.98
8.00	400.6	70.3	2.271	153.5	0.084	0.2357	558.	500.	0.00326	0.86	0.46	1.29	7.12	-0.001	0.88
8.75	399.4	71.2	2.141	162.8	0.091	0.2677	529.	471.	0.00350	0.88	0.40	1.27	6.62	-0.004	0.83
10.00	397.6	72.8	1.941	179.6	0.102	0.3234	516.	458.	0.00363	0.86	0.40	1.21	6.29	-0.008	0.73
11.50	395.4	74.8	1.726	202.0	0.116	0.3936	491.	432.	0.00391	0.86	0.52	1.17	5.78	-0.015	0.64
13.00	393.1	77.0	1.538	226.6	0.129	0.4642	479.	429.	0.00406	0.84	0.55	1.11	5.46	-0.022	0.57
14.50	390.5	79.6	1.377	253.1	0.143	0.5320	463.	404.	0.00430	0.84	0.59	1.05	5.07	-0.037	0.52
16.00	387.8	82.5	1.239	281.4	0.155	0.5946	452.	392.	0.00450	0.82	0.62	1.02	4.76	-0.043	0.48



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.251 inch; heated tube length, 18 inches; material, Inconel

RC-B	RL-F	RE-F, MN	PR-B	PR-F	XITF	VIS-RAT	PHI-B	PHI-F	EFLUX	DQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.12 TEST VOLTAGE, 24.1 HEAT INPUT/UNIT AREA, 0.773 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1897956.	1127706.	652880.	1.256	0.629	18.0395	3.397	0.2945	0.3314	0.00513	0.77	0.594	255.8	0.36	1.76
2012425.	1138929.	652497.	1.284	0.627	15.3727	3.504	0.3080	0.3297	0.00516	0.77	0.588	259.7	0.38	1.73
2135678.	973096.	6130591.	1.320	0.607	12.3030	4.384	0.3228	0.3108	0.00534	0.77	0.477	248.4	0.35	1.70
2268384.	880354.	5811496.	1.363	0.602	10.1354	5.177	0.3390	0.3010	0.00542	0.77	0.429	241.5	0.33	1.66
2337636.	639321.	4964721.	1.390	0.609	8.3418	7.783	0.3478	0.2880	0.00560	0.77	0.354	216.3	0.27	1.62
2413136.	794887.	5458766.	1.419	0.602	8.3764	6.174	0.3571	0.2929	0.00549	0.77	0.394	234.1	0.32	1.62
2489905.	696513.	5065281.	1.453	0.606	7.4047	7.439	0.3669	0.2877	0.00555	0.77	0.365	223.7	0.29	1.60
2527351.	743495.	4874146.	1.439	0.603	6.6977	7.081	0.3694	0.2950	0.00500	0.77	0.360	222.1	0.29	1.60
2688880.	763067.	4888390.	1.512	0.601	5.9058	7.052	0.3899	0.2947	0.00496	0.77	0.367	226.7	0.31	1.57
2987107.	641190.	4479298.	1.759	0.616	4.7471	9.783	0.4370	0.2868	0.00547	0.77	0.351	217.6	0.30	1.51
3190806.	585079.	4089077.	1.944	0.624	3.9766	11.671	0.4700	0.2881	0.00543	0.78	0.339	210.0	0.30	1.47
3411599.	530915.	3684040.	2.205	0.632	3.3251	14.043	0.5103	0.2905	0.00537	0.78	0.330	202.0	0.29	1.45
HEAT BALANCE, 0.03 TEST VOLTAGE, 49.9 HEAT INPUT/UNIT AREA, 2.878 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1771074.	66283.	453262.	1.401	0.694	1.4598	73.652	0.4159	0.4052	0.01532	2.90	0.941	67.3	0.63	2.57
2356375.	63938.	270005.	1.560	0.686	0.6757	102.978	0.4907	0.4048	0.01263	2.92	0.853	64.4	0.72	2.92
2843119.	98467.	267632.	1.315	0.693	0.3956	78.595	0.4844	0.4051	0.01042	2.90	0.878	70.9	0.87	2.80
3127585.	143756.	283435.	1.004	0.694	0.2470	57.954	0.4444	0.4073	0.00868	2.89	0.890	77.0	0.97	2.71
3203071.	170967.	298532.	0.874	0.686	0.1992	49.690	0.4215	0.4111	0.00798	2.88	0.887	80.1	0.99	2.68
3240404.	191366.	302784.	0.780	0.684	0.1608	44.611	0.4013	0.4118	0.00733	2.88	0.874	82.2	1.00	2.69
3249045.	231357.	337079.	0.714	0.678	0.1352	36.545	0.3840	0.4158	0.00685	2.87	0.881	86.6	1.01	2.63
3213760.	278115.	365346.	0.645	0.678	0.1005	29.431	0.3603	0.4165	0.00607	2.87	0.866	91.5	1.01	2.61
3119735.	338075.	407448.	0.604	0.679	0.0735	22.831	0.3385	0.4172	0.00534	2.86	0.847	97.9	1.00	2.58
3000608.	380684.	433515.	0.591	0.679	0.0553	19.068	0.3253	0.4168	0.00474	2.86	0.812	102.6	0.97	2.59
2876768.	425140.	465975.	0.592	0.679	0.0436	15.965	0.3194	0.4166	0.00428	2.86	0.785	107.7	0.95	2.59
2753720.	460843.	491829.	0.599	0.679	0.0354	13.786	0.3164	0.4161	0.00389	2.86	0.756	112.2	0.93	2.61
HEAT BALANCE, 0.00 TEST VOLTAGE, 49.9 HEAT INPUT/UNIT AREA, 2.882 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1846953.	103069.	946865.	1.295	0.677	2.7426	49.656	0.3544	0.4159	0.01306	2.89	0.824	88.3	0.46	2.30
2377650.	81319.	544843.	1.399	0.691	1.3585	81.155	0.4189	0.4051	0.01138	2.92	0.734	81.8	0.49	2.65
2964284.	111709.	500627.	1.525	0.696	0.8524	72.123	0.4777	0.4059	0.01006	2.90	0.746	88.8	0.60	2.61
3502283.	158442.	499715.	1.415	0.677	0.5587	59.866	0.4896	0.4151	0.00887	2.89	0.758	95.8	0.70	2.58
3722489.	184551.	501795.	1.323	0.678	0.4595	54.096	0.4844	0.4166	0.00830	2.88	0.768	99.1	0.74	2.55
3903296.	204980.	489052.	1.219	0.678	0.3759	50.771	0.4743	0.4169	0.00773	2.88	0.767	100.9	0.77	2.56
4049764.	252179.	532721.	1.098	0.679	0.3211	42.027	0.4587	0.4172	0.00733	2.87	0.795	106.5	0.82	2.47
4216860.	306586.	549826.	0.914	0.680	0.2401	35.420	0.4291	0.4157	0.00661	2.87	0.802	111.2	0.86	2.43
4306291.	386719.	590281.	0.766	0.680	0.1763	27.985	0.3980	0.4138	0.00592	2.86	0.812	118.1	0.90	2.36
4311637.	455610.	628463.	0.679	0.681	0.1307	23.315	0.3729	0.4130	0.00530	2.86	0.803	123.6	0.91	2.34
4262349.	528040.	670239.	0.629	0.681	0.0988	19.458	0.3523	0.4123	0.00478	2.86	0.794	129.4	0.91	2.32
4173124.	593873.	708946.	0.603	0.682	0.0760	16.586	0.3354	0.4118	0.00434	2.85	0.779	134.9	0.91	2.32
HEAT BALANCE, -0.04 TEST VOLTAGE, 49.8 HEAT INPUT/UNIT AREA, 2.890 ID, 0.220 OD, 0.251 LENGTH, 18.0														
2136103.	191596.	1972191.	1.227	0.678	5.0198	30.256	0.3079	0.4160	0.00978	2.88	0.711	124.3	0.35	2.07
2056512.	141830.	1296836.	1.276	0.682	2.7535	49.999	0.3491	0.4130	0.00888	2.91	0.616	114.4	0.34	2.32
3074892.	163899.	1140800.	1.340	0.676	1.8357	51.511	0.3938	0.4162	0.00833	2.91	0.607	119.9	0.39	2.39
3638571.	205951.	1080671.	1.395	0.678	1.3084	47.567	0.4350	0.4187	0.00780	2.90	0.618	128.2	0.45	2.37
3933687.	235411.	1080722.	1.436	0.679	1.1213	44.458	0.4552	0.4174	0.00758	2.89	0.630	133.1	0.49	2.33
4225560.	246112.	1008226.	1.486	0.679	0.9352	45.603	0.4766	0.4175	0.00724	2.89	0.625	133.9	0.51	2.36
4513439.	301183.	1074673.	1.491	0.679	0.8246	39.019	0.4843	0.4146	0.00710	2.88	0.653	141.7	0.56	2.27
4949184.	354297.	1057326.	1.384	0.680	0.6402	35.901	0.4854	0.4132	0.00664	2.87	0.666	146.9	0.61	2.24
5378704.	441423.	1084143.	1.262	0.680	0.4879	30.688	0.4779	0.4113	0.00616	2.87	0.689	154.7	0.67	2.18
5708819.	522684.	1084423.	1.104	0.680	0.3713	27.107	0.4593	0.4102	0.00567	2.86	0.701	160.2	0.72	2.15
5946610.	626704.	1134232.	0.944	0.679	0.2894	23.108	0.4345	0.4071	0.00525	2.86	0.719	167.2	0.76	2.10
6099008.	725130.	1170313.	0.820	0.679	0.2252	20.155	0.4108	0.4030	0.00486	2.86	0.729	173.1	0.80	2.06
HEAT BALANCE, -0.06 TEST VOLTAGE, 34.5 HEAT INPUT/UNIT AREA, 1.411 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1581026.	387948.	2527666.	1.253	0.629	6.4103	9.410	0.3219	0.3384	0.00841	1.40	0.650	136.5	0.42	1.73
1799082.	281529.	1915754.	1.298	0.661	4.0633	15.394	0.3524	0.3724	0.00785	1.40	0.575	123.2	0.37	1.79
2046217.	230655.	1488904.	1.355	0.674	2.7478	22.365	0.3854	0.3946	0.00721	1.41	0.521	115.2	0.35	1.90
2318379.	220195.	1250284.	1.415	0.678	1.9923	26.843	0.4185	0.4046	0.00673	1.41	0.496	112.9	0.35	1.98
2462776.	221876.	1170431.	1.444	0.679	1.7229	28.311	0.4344	0.4070	0.00652	1.41	0.490	112.8	0.36	2.01
2609096.	229955.	1125525.	1.476	0.679	1.5093	28.857	0.4500	0.4070	0.00534	1.41	0.488	113.6	0.37	2.02
2757737.	266331.	1179039.	1.519	0.675	1.3760	25.844	0.4561	0.3971	0.00629	1.41	0.506	118.7	0.41	1.94
3005225.	296980.	1145392.	1.598	0.674	1.1283	24.783	0.4916	0.3932	0.00603	1.41	0.514	121.7	0.44	1.91
3288923.	346730.	1160701.	1.560	0.670	0.9108	21.952	0.5017	0.3852	0.00577	1.40	0.534	127.2	0.49	1.85
3540516.	406187.	1150392.	1.449	0.668	0.7361	20.351	0.4974	0.3810	0.00546	1.40	0.547	130.9	0.53	1.81
3756851.	473794.	1173965.	1.353	0.665	0.6057	18.182	0.4915	0.3751	0.00520	1.40	0.565	135.6	0.58	1.76
3936773.	534915.	1172811.	1.233	0.663	0.4970	16.653	0.4788	0.3709	0.00490	1.40	0.578	139.0	0.62	1.73
HEAT BALANCE, -0.03 TEST VOLTAGE, 34.5 HEAT INPUT/UNIT AREA, 1.402 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1393668.	156701.	1170843.	1.308	0.676	3.4971	22.845	0.3572	0.3992	0.00974	1.40	0.640	89.1	0.39	1.92
1645764.	131579.	866015.	1.384	0.680	2.1765	32.619	0.4005	0.4116	0.00877	1.40	0.577	83.9	0.38	2.08
1925482.	140170.	745019.	1.458	0.680	1.5088	35.895	0.4419	0.4121	0.00810	1.41	0.563	84.9	0.41	2.14
2215073.	169647.	714315.	1.566	0.680	1.1119	33.521	0.4322	0.4106	0.00757	1.40	0.576	89.0	0.47	2.11
2358761.	177820.	673726.	1.595	0.680	0.9414	33.985	0.4369	0.4107	0.00723	1.40	0.573	89.5	0.49	2.13
2495281.														

TABLE IV. - Continued. UNIFORMLY

(d) Continued. Test section 4; tube inside diameter, 0.220 inch; tube outside

EL	PB	TB	ROB	VELOC	M	x2	TU	TW	H	H/HIK	H/HMW	H/HF	FW/TB	THETA	ROFM
RUN 20-1036 WEIGHT FLOW, 0.1720 HEAT INPUT, 16.75 INLET BULK TEMP, 52.1 OUTLET BULK TEMP, 71.0 PLOT CH K															
2.00	414.0	55.2	3.816	170.7	0.056	0.0287	221.	157.	0.01314	2.17	1.15	2.28	2.85	0.148	3.62
3.50	412.4	57.3	3.681	177.0	0.061	0.0374	233.	171.	0.01184	2.10	1.00	2.22	2.98	0.114	3.40
5.00	410.8	59.3	3.542	183.9	0.067	0.0477	248.	187.	0.01056	1.98	0.86	2.12	3.15	0.086	3.16
6.50	409.1	61.0	3.400	191.6	0.073	0.0600	248.	186.	0.01076	1.96	0.81	2.11	3.05	0.073	2.97
7.25	407.8	61.8	3.327	195.8	0.077	0.0669	304.	244.	0.00742	1.56	0.62	1.75	3.94	0.045	2.65
8.00	406.8	62.6	3.254	200.2	0.081	0.0743	284.	223.	0.00841	1.68	0.65	1.86	3.56	0.046	2.63
8.75	405.6	63.3	3.180	204.9	0.085	0.0823	287.	226.	0.00828	1.64	0.62	1.83	3.57	0.041	2.51
10.00	403.5	64.5	3.055	213.3	0.093	0.0969	302.	242.	0.00760	1.50	0.56	1.70	3.76	0.031	2.29
11.50	401.1	65.7	2.904	224.4	0.103	0.1167	320.	261.	0.00693	1.34	0.50	1.55	3.97	0.021	2.03
13.00	398.5	66.8	2.752	236.7	0.114	0.1391	349.	290.	0.00606	1.15	0.43	1.37	4.34	0.013	1.75
14.50	395.4	67.8	2.599	250.7	0.127	0.1644	371.	313.	0.00554	1.01	0.37	1.24	4.61	0.007	1.52
16.00	391.8	68.7	2.445	266.5	0.142	0.1930	388.	330.	0.00520	0.91	0.36	1.13	4.80	0.002	1.32
RUN 22-1029 WEIGHT FLOW, 0.0930 HEAT INPUT, 35.90 INLET BULK TEMP, 59.5 OUTLET BULK TEMP, 150.3 PLOT CH M															
2.00	706.6	70.5	3.267	107.9	0.039	0.1085	976.	879.	0.00360	1.14	0.96	1.83	12.46	0.016	1.54
3.50	705.2	77.4	2.810	125.4	0.051	0.1970	1037.	940.	0.00338	0.93	0.81	1.61	12.16	0.007	0.98
5.00	703.8	83.7	2.393	147.2	0.065	0.3064	948.	851.	0.00378	0.91	0.78	1.48	10.17	-0.001	0.75
6.50	702.5	90.0	2.037	173.0	0.078	0.4249	836.	735.	0.00447	0.94	0.83	1.37	8.17	-0.011	0.63
7.25	701.4	93.4	1.883	187.1	0.085	0.4827	814.	712.	0.00465	0.92	0.84	1.31	7.63	-0.017	0.58
8.00	700.4	96.9	1.745	201.9	0.091	0.5379	810.	708.	0.00471	0.89	0.85	1.25	7.31	-0.023	0.53
8.75	699.1	100.5	1.620	217.4	0.097	0.5894	771.	667.	0.00507	0.90	0.89	1.21	6.63	-0.031	0.51
10.00	697.0	107.1	1.443	244.2	0.107	0.6645	722.	647.	0.00532	0.88	0.91	1.14	6.04	-0.045	0.47
11.50	694.1	115.3	1.274	276.6	0.118	0.7341	722.	614.	0.00574	0.88	0.94	1.08	5.33	-0.065	0.44
13.00	690.3	124.1	1.136	310.0	0.130	0.7862	717.	610.	0.00590	0.85	0.94	1.03	4.91	-0.086	0.41
14.50	685.8	133.3	1.023	344.5	0.141	0.9960	707.	599.	0.00614	0.84	0.94	0.99	4.49	-0.109	0.34
16.00	680.9	142.9	0.928	379.8	0.151	0.9999	709.	601.	0.00625	0.82	0.93	0.95	4.20	-0.133	0.33
RUN 24-1027 WEIGHT FLOW, 0.1480 HEAT INPUT, 36.25 INLET BULK TEMP, 56.5 OUTLET BULK TEMP, 111.6 PLOT CH O															
2.00	707.7	64.3	3.643	153.9	0.050	0.0564	611.	495.	0.00672	1.34	1.08	1.62	7.71	0.044	2.70
3.50	705.2	69.2	3.346	167.6	0.060	0.0959	731.	623.	0.00527	1.06	0.83	1.41	8.99	0.025	1.96
5.00	702.8	73.7	3.050	183.8	0.071	0.1467	790.	684.	0.00479	0.91	0.71	1.29	9.28	0.015	1.46
6.50	700.5	77.9	2.764	202.8	0.083	0.2068	783.	678.	0.00488	0.85	0.67	1.21	8.70	0.009	1.17
7.25	698.7	79.9	2.627	213.5	0.091	0.2401	754.	646.	0.00516	0.85	0.66	1.19	8.09	0.005	1.08
8.00	697.3	81.8	2.494	224.8	0.098	0.2756	755.	648.	0.00516	0.82	0.64	1.15	7.92	0.002	0.97
8.75	695.6	83.7	2.366	237.0	0.105	0.3130	699.	589.	0.00577	0.86	0.67	1.15	7.03	-0.002	0.94
10.00	692.9	87.0	2.167	258.7	0.117	0.3765	673.	561.	0.00613	0.85	0.68	1.12	6.45	-0.009	0.85
11.50	689.3	91.0	1.953	287.1	0.131	0.4521	637.	522.	0.00672	0.86	0.71	1.08	5.74	-0.020	0.77
13.00	685.2	95.2	1.764	317.8	0.145	0.5251	614.	498.	0.00718	0.85	0.74	1.05	5.23	-0.032	0.70
14.50	680.7	99.7	1.599	350.6	0.158	0.5927	590.	473.	0.00775	0.85	0.77	1.02	4.74	-0.047	0.65
16.00	675.6	104.6	1.455	385.3	0.171	0.6528	579.	461.	0.00811	0.84	0.80	0.98	4.41	-0.064	0.60
RUN 28-1046 WEIGHT FLOW, 0.0910 HEAT INPUT, 16.70 INLET BULK TEMP, 54.7 OUTLET BULK TEMP, 93.0 PLOT CH S															
2.00	651.1	60.7	3.771	91.4	0.029	0.0419	361.	302.	0.00552	1.57	1.08	1.72	4.97	0.084	3.26
3.50	650.3	64.7	3.547	97.2	0.033	0.0656	410.	351.	0.00466	1.31	0.88	1.48	5.43	0.056	2.77
5.00	649.5	68.2	3.319	103.9	0.038	0.0959	455.	397.	0.00407	1.11	0.74	1.30	5.81	0.038	2.30
6.50	648.9	71.5	3.092	111.5	0.043	0.1327	479.	421.	0.00383	0.99	0.65	1.19	5.89	0.027	1.92
7.25	648.4	73.0	2.979	115.7	0.046	0.1534	486.	428.	0.00378	0.95	0.63	1.15	5.86	0.022	1.76
8.00	647.9	74.5	2.868	120.2	0.049	0.1754	527.	471.	0.00340	0.84	0.57	1.05	6.31	0.016	1.55
8.75	647.3	76.0	2.759	124.9	0.053	0.1987	511.	454.	0.00356	0.85	0.57	1.05	5.97	0.012	1.46
10.00	646.2	78.4	2.582	133.5	0.059	0.2407	512.	455.	0.00356	0.81	0.55	1.01	5.81	0.006	1.28
11.50	644.9	81.1	2.380	144.8	0.066	0.2958	489.	432.	0.00382	0.81	0.55	0.97	5.33	-0.002	1.15
13.00	643.6	83.9	2.192	157.3	0.073	0.3537	473.	415.	0.00405	0.81	0.56	0.97	4.95	-0.010	1.04
14.50	642.0	86.8	2.020	170.7	0.080	0.4118	450.	392.	0.00438	0.82	0.59	0.97	4.52	-0.021	0.96
16.00	640.0	89.7	1.864	185.0	0.087	0.4694	431.	372.	0.00473	0.83	0.61	0.96	4.15	-0.033	0.90
RUN 30-1038 WEIGHT FLOW, 0.1510 HEAT INPUT, 17.41 INLET BULK TEMP, 51.1 OUTLET BULK TEMP, 78.5 PLOT CH U															
2.00	712.6	55.4	4.078	140.3	0.040	0.0178	212.	144.	0.01571	1.55	1.62	1.58	2.60	0.318	4.02
3.50	711.5	58.4	3.943	145.1	0.043	0.0275	223.	157.	0.01420	1.57	1.41	1.62	2.68	0.256	3.84
5.00	710.3	61.2	3.807	150.2	0.046	0.0393	244.	178.	0.01192	1.50	1.17	1.56	2.91	0.190	3.62
6.50	709.3	63.8	3.669	155.9	0.050	0.0534	240.	174.	0.01265	1.54	1.14	1.59	2.73	0.178	3.45
7.25	708.4	65.1	3.599	158.9	0.052	0.0615	262.	197.	0.01059	1.42	0.99	1.49	3.03	0.139	3.28
8.00	707.6	66.3	3.529	162.1	0.055	0.0701	255.	191.	0.01123	1.45	0.93	1.52	2.88	0.137	3.21
8.75	706.8	67.4	3.459	165.4	0.057	0.0795	256.	191.	0.01128	1.45	0.96	1.52	2.84	0.128	3.11
10.00	705.4	69.3	3.342	171.2	0.061	0.0965	263.	198.	0.01085	1.41	0.90	1.48	2.86	0.108	2.93
11.50	703.6	71.5	3.202	178.7	0.066	0.1192	271.	206.	0.01038	1.35	0.83	1.43	2.88	0.087	2.72
13.00	701.6	73.5	3.062	186.8	0.072	0.1443	282.	218.	0.00967	1.28	0.76	1.36	2.97	0.066	2.49
14.50	699.2	75.5	2.924	195.6	0.078	0.1715	292.	228.	0.00918	1.20	0.71	1.29	3.02	0.049	2.29
16.00	696.5	77.4	2.788	205.2	0.084	0.2007	296.	232.	0.00904	1.16	0.68	1.24	3.00	0.035	2.11
RUN 33-1035 WEIGHT FLOW, 0.0720 HEAT INPUT, 35.05 INLET BULK TEMP, 96.9 OUTLET BULK TEMP, 228.9 PLOT CH X															
2.00	599.8	110.7	1.166	233.9	0.104	0.7516	862.	776.	0.00423	0.90	1.00	1.24	7.01	-0.048	0.32
3.50	597.6	122.0	1.004	271.7	0.117	0.8183	968.	884.	0.00372	0.77	0.92	1.08	7.24	-0.057	0.26
5.00	595.3	134.2	0.879	310.3	0.129	0.9822	971.	887.	0.00377	0.74	0.89	1.00	6.61	-0.074	0.22
6.50	593.2	146.7	0.783	348.4	0.140	0.9999	970.	886.	0.00384	0.73	0.87	0.94	6.04	-0.093	0.21
7.25	591.7	152.6	0.744	366.6	0.145	0.9999	930.	846.	0.00408	0.75	0.88	0.93	5.54	-0.107	0.22
8.00	590.5	158.6	0.709	384.6	0.151	0.9999	932.	848.	0.00410	0.74	0.86	0.91	5.34	-0.117	0.22
8.75	589.0	164.7	0.677	402.7	0.156	0.9999	890.	806.	0.00440	0.76	0.87	0.91	4.89	-0.135	0.22
10.00	586.9	174.8	0.631	432.6	0.164	0.9999	864.	779.	0.00466	0.77	0.86	0.91	4.45	-0.160	0.23
11.50	584.0	186.4	0.584	467.0	0.173	0.9999	831.	744.	0.00504	0.79	0.86	0.91	3.99	-0.195	0.23
13.00	580.7	197.5	0.545	500.4	0.182	0.9999	817.	723.	0.00528	0.80	0.84	0.90	3.69	-0.226	0.23
14.50	577.0	208.7	0.511	534.2	0.190	0.9999	797.	708.	0.00561	0.81	0.83	0.90	3.39	-0.262	0.23
16.00	572.5	219.5	0.480	568.2	0.198	0.9999	801.	713.	0.00569	0.81	0.81	0.89	3.25	-0.288	0.23

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.251 inch; heated tube length, 18 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DUOL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.10 TEST VOLTAGE, 33.8 HEAT INPUT/UNIT AREA, 1.348 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1996144.	1221936.	5325990.	1.223	0.600	12.1911	3.398	0.2963	0.3381	0.00559	1.34	0.703	235.0	0.48	1.77
2178445.	1103436.	5024491.	1.244	0.591	9.0307	4.096	0.3149	0.3301	0.00565	1.34	0.634	229.9	0.46	1.73
2373869.	993342.	4667321.	1.271	0.591	6.8099	4.994	0.3350	0.3254	0.00566	1.34	0.582	223.6	0.45	1.69
2597911.	1022610.	4565635.	1.304	0.591	5.4750	5.225	0.3563	0.3250	0.00559	1.34	0.583	227.3	0.47	1.66
2715992.	710477.	3680659.	1.324	0.613	4.2792	8.376	0.3676	0.3275	0.00555	1.35	0.496	199.8	0.38	1.65
2837919.	817724.	3884429.	1.344	0.603	4.0399	7.399	0.3791	0.3221	0.00553	1.35	0.517	210.3	0.43	1.62
2964822.	814420.	3773407.	1.366	0.605	3.6249	7.756	0.3907	0.3224	0.00548	1.35	0.516	210.0	0.43	1.61
3185818.	761896.	3456160.	1.403	0.615	2.9776	9.012	0.4100	0.3273	0.00534	1.35	0.499	204.7	0.43	1.59
3463296.	715454.	3106705.	1.446	0.625	2.3714	10.581	0.4324	0.3335	0.00516	1.35	0.483	199.2	0.42	1.59
3751165.	640526.	2674389.	1.496	0.640	1.8715	13.081	0.4545	0.3444	0.00493	1.35	0.459	190.4	0.41	1.61
4047470.	604037.	2362169.	1.572	0.650	1.5070	15.186	0.4784	0.3540	0.00468	1.36	0.443	184.8	0.40	1.65
4347870.	587794.	2122034.	1.642	0.656	1.2269	16.934	0.4999	0.3617	0.00444	1.36	0.431	181.1	0.40	1.68
HEAT BALANCE, 0.05 TEST VOLTAGE, 50.3 HEAT INPUT/UNIT AREA, 2.879 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1475604.	76180.	546790.	1.136	0.690	1.8196	41.451	0.3548	0.4079	0.01000	2.91	0.874	68.7	0.53	2.52
1865902.	79583.	386143.	1.063	0.686	0.9513	50.551	0.3913	0.4075	0.00876	2.92	0.803	69.6	0.61	2.77
2211011.	134144.	364671.	0.999	0.691	0.6007	43.305	0.4103	0.4080	0.00770	2.90	0.800	76.1	0.72	2.73
2452887.	194270.	398897.	0.890	0.681	0.4166	32.087	0.4052	0.4161	0.00688	2.88	0.868	84.9	0.82	2.66
2532248.	219052.	403890.	0.842	0.673	0.3477	29.074	0.3798	0.4197	0.00648	2.88	0.861	87.8	0.84	2.67
2586821.	236524.	398289.	0.793	0.672	0.2902	27.280	0.3827	0.4201	0.00607	2.88	0.789	89.7	0.86	2.68
2620429.	275412.	427500.	0.748	0.667	0.2519	23.275	0.3848	0.4240	0.00577	2.87	0.799	94.2	0.88	2.65
2638001.	317737.	444546.	0.685	0.668	0.1984	19.876	0.3721	0.4248	0.00524	2.87	0.787	98.7	0.90	2.65
2616199.	378011.	484006.	0.639	0.668	0.1589	16.050	0.3636	0.4262	0.00475	2.86	0.783	105.1	0.92	2.62
2567308.	417814.	503464.	0.613	0.668	0.1314	13.945	0.3582	0.4258	0.00431	2.86	0.761	109.5	0.91	2.63
2503281.	462680.	464086.	0.600	0.668	0.0032	11.968	0.3545	0.4258	0.00395	2.86	0.746	114.5	0.98	2.70
2431700.	494251.	494293.	0.594	0.668	0.0001	10.467	0.3523	0.4249	0.00362	2.86	0.723	118.3	0.95	2.71
HEAT BALANCE, 0.00 TEST VOLTAGE, 50.3 HEAT INPUT/UNIT AREA, 2.921 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1881868.	331074.	1951812.	1.163	0.662	4.5744	14.227	0.3135	0.4241	0.00776	2.89	0.814	126.7	0.46	2.02
2245308.	253610.	1352251.	1.145	0.667	2.4468	22.894	0.3466	0.4263	0.00691	2.92	0.701	117.3	0.43	2.23
2640745.	238694.	1041536.	1.109	0.667	1.5222	28.821	0.3749	0.4247	0.00632	2.93	0.648	115.5	0.45	2.40
3034499.	264054.	919776.	1.058	0.668	1.0616	29.618	0.3745	0.4248	0.00584	2.93	0.632	119.3	0.50	2.46
3222302.	295801.	919232.	1.040	0.668	0.9183	27.695	0.4025	0.4265	0.00566	2.92	0.638	123.7	0.53	2.45
3397666.	308394.	869397.	1.024	0.668	0.7799	27.905	0.4088	0.4262	0.00542	2.92	0.623	125.0	0.54	2.48
3559331.	371145.	936916.	0.999	0.667	0.6992	23.685	0.4117	0.4255	0.00532	2.91	0.654	132.7	0.59	2.40
3788007.	428898.	937006.	0.939	0.667	0.5608	21.402	0.4100	0.4248	0.00533	2.91	0.660	138.5	0.64	2.38
3994328.	518448.	975912.	0.873	0.666	0.4439	18.152	0.4044	0.4239	0.00472	2.90	0.674	146.9	0.69	2.34
4132940.	602633.	1004647.	0.810	0.665	0.3542	15.777	0.3959	0.4235	0.00441	2.89	0.682	153.8	0.73	2.31
4213523.	701622.	1057966.	0.749	0.664	0.2883	13.439	0.3856	0.4230	0.00414	2.89	0.694	161.6	0.76	2.28
4247482.	781223.	1066401.	0.697	0.664	0.2373	11.913	0.3753	0.4228	0.00386	2.89	0.694	167.6	0.78	2.28
HEAT BALANCE, 0.03 TEST VOLTAGE, 33.5 HEAT INPUT/UNIT AREA, 1.345 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1071732.	376001.	1827545.	1.179	0.618	7.4770	6.422	0.2992	0.3688	0.00718	1.33	0.729	107.0	0.45	1.83
1231958.	371702.	1524241.	1.175	0.638	4.5288	8.914	0.3260	0.3884	0.00675	1.33	0.660	102.3	0.43	1.85
1409762.	280808.	1262358.	1.168	0.651	2.9485	11.700	0.3522	0.4025	0.00627	1.34	0.607	98.9	0.42	1.91
1599348.	273670.	1091435.	1.149	0.657	2.0690	13.818	0.3755	0.4093	0.00586	1.34	0.577	98.2	0.43	1.97
1696250.	275657.	1027508.	1.133	0.658	1.7672	14.585	0.3853	0.4115	0.00567	1.34	0.567	98.4	0.44	2.00
1792762.	249054.	890592.	1.116	0.665	1.4637	17.401	0.3937	0.4214	0.00536	1.34	0.535	94.9	0.42	2.10
1867785.	271138.	889996.	1.100	0.663	1.3014	16.611	0.4012	0.4187	0.00526	1.34	0.541	97.6	0.44	2.08
2039809.	285869.	833754.	1.082	0.664	1.0471	16.914	0.4122	0.4196	0.00499	1.34	0.534	98.9	0.46	2.11
2206126.	303294.	830822.	1.051	0.660	0.8389	15.486	0.4198	0.4144	0.00476	1.34	0.544	103.3	0.50	2.07
2347425.	375077.	828159.	0.991	0.658	0.6791	14.110	0.4186	0.4107	0.00452	1.34	0.552	107.2	0.54	2.05
2460822.	434811.	853793.	0.933	0.654	0.5634	12.323	0.4143	0.4055	0.00432	1.34	0.568	112.2	0.59	2.00
2547550.	498790.	884425.	0.880	0.651	0.4718	10.838	0.4084	0.4012	0.00413	1.34	0.585	117.1	0.63	1.96
HEAT BALANCE, 0.06 TEST VOLTAGE, 34.3 HEAT INPUT/UNIT AREA, 1.396 ID, 0.220 OD, 0.251 LENGTH, 18.0														
1450735.	173234.	415301.	1.193	0.763	26.2732	1.629	0.2640	0.3871	0.00395	1.39	1.070	221.7	0.59	1.89
1587063.	157950.	4146755.	1.178	0.688	16.5618	1.950	0.2788	0.3723	0.00411	1.39	0.928	218.4	0.57	1.85
1732536.	135436.	3974204.	1.170	0.628	10.9609	2.509	0.2744	0.3618	0.00422	1.40	0.769	209.5	0.52	1.82
1888606.	1417658.	3940699.	1.164	0.630	8.2857	2.545	0.3104	0.3622	0.00418	1.39	0.783	216.5	0.56	1.79
1971378.	1221469.	3708165.	1.161	0.605	6.7580	3.164	0.3184	0.3568	0.00421	1.40	0.676	205.4	0.51	1.78
2056628.	1289203.	3726070.	1.157	0.608	6.0522	3.075	0.3264	0.3576	0.00418	1.40	0.698	210.8	0.54	1.76
2144549.	1297656.	3679689.	1.153	0.607	5.3439	3.164	0.3343	0.3572	0.00416	1.40	0.694	212.3	0.55	1.75
2296069.	1266851.	3543866.	1.144	0.601	4.3297	3.462	0.3471	0.3558	0.00412	1.40	0.667	211.5	0.56	1.73
2464566.	1236921.	3372756.	1.130	0.597	3.4257	3.831	0.3613	0.3546	0.00405	1.40	0.641	210.5	0.56	1.70
2677926.	1185220.	3171118.	1.111	0.595	2.7312	4.332	0.3740	0.3543	0.00397	1.40	0.608	207.5	0.56	1.69
2872676.	1156111.	2988603.	1.088	0.597	2.2219	4.777	0.3846	0.3566	0.00386	1.40	0.586	205.7	0.56	1.68
3064975.	1166974.	2867307.	1.065	0.599	1.8511	5.029	0.3936	0.3579	0.00375	1.40	0.579	206.3	0.57	1.66
HEAT BALANCE, 0.04 TEST VOLTAGE, 49.7 HEAT INPUT/UNIT AREA, 2.628 ID, 0.220 OD, 0.251 LENGTH, 18.0														
2128351.	199508.	255366.	0.632	0.694	0.1187	26.399	0.3599	0.4076	0.00598	2.82	0.864	74.6	1.04	2.79
2063053.	167673.	222991.	0.602	0.687	0.0847	27.410	0.3514	0.4066	0.00515	2.83	0.762	73.5	0.95	3.00
1981727.	208137.	211301.	0.592	0.687	0.0099	23.299	0.3466	0.4065	0.00458	2.83	0.721	76.9	0.99	3.07
1897552.	228851.	228873.	0.594	0.686	0.0001	19.881	0.3457	0.4064	0.00413	2.83	0.687	80.5	0.94	3.09
1850892.	253665.	253688.	0.598	0.688	0.0001	17.195	0.3482	0.4066	0.00397	2.83	0.691	84.0	0.93	3.03
1820944.	262208.	262231.	0.603	0.687	0.0001	16.145	0.3511	0.4065	0.00381	2.83	0.677	85.5	0.91	3.05
1764189.	290985.	291003.	0.608	0.689	0.0002	13.906	0.3542	0.4067	0.00368	2.82	0.686	89.4	0.91	2.99
1725458.	320588.	320614.	0.617	0.690	0.0002	11.872	0.3598	0.4068	0.00347	2.82	0.683	93.7	0.91	2.96
1662600.	358600.	358627.	0.627	0.692	0.0002	9.872	0.3675	0.4069	0.00327	2.81	0.688	98.9	0.91	2.92
1606618.	394959.	384930.	0.636	0.692	0.0002	8.649	0.3757	0.4069	0.00310	2.81	0.685	102.9	0.90	2.91
1554851.	415339.	415376.	0.644	0.692	0.0001	7.524	0.3840	0.4069	0.00295	2.80	0.691	107.3	0.90	2.89
1507792.	426691.	426732.	0.651	0.692	0.0001	6.984	0.3913	0.4068	0.00281	2.80	0.680	109.7	0.89	2.92

TABLE IV. - Continued. UNIFORMLY

(d) Concluded. Test section 4; tube inside diameter, 0.220 inch; tube outside

EL	P8	T0	ROE	VELUC	M	X2	T0	Tw	H	H/HHK	H/HHW	H/HF	Tw/T0	THETA	RDFM
RUN 34-1032 WEIGHT FLOW, 0.0810 HEAT INPUT, 35.79 INLET BULK TEMP, 70.8 OUTLET BULK TEMP, 190.0 PLOT CH Y															
2.00	285.7	80.1	0.882	347.7	0.201	0.6925	1143.	1047.	0.00303	0.60	0.58	1.41	13.08	-0.016	0.13
3.50	280.8	89.7	0.698	439.3	0.235	0.7989	953.	857.	0.00377	0.74	1.04	1.29	9.55	-0.033	0.14
5.00	274.9	100.7	0.571	537.0	0.267	0.8685	846.	748.	0.00445	0.82	1.15	1.20	7.42	-0.056	0.14
6.50	268.7	112.5	0.481	638.0	0.299	0.9126	789.	686.	0.00500	0.85	1.20	1.13	6.09	-0.085	0.14
7.25	263.8	118.4	0.443	693.4	0.318	0.9286	757.	652.	0.00536	0.87	1.23	1.11	5.51	-0.103	0.14
8.00	259.9	124.4	0.410	747.6	0.335	0.9413	764.	660.	0.00534	0.86	1.20	1.07	5.30	-0.114	0.13
8.75	255.1	130.5	0.381	806.4	0.354	0.9518	744.	639.	0.00562	0.87	1.21	1.06	4.89	-0.132	0.13
10.00	247.9	140.8	0.339	905.6	0.385	0.9652	749.	644.	0.00568	0.85	1.17	1.02	4.57	-0.155	0.12
11.50	238.8	152.5	0.298	1028.1	0.424	0.9999	754.	648.	0.00576	0.84	1.12	0.98	4.25	-0.181	0.11
13.00	228.3	164.0	0.264	1163.7	0.468	0.9999	768.	664.	0.00572	0.82	1.05	0.94	4.05	-0.204	0.10
14.50	216.5	175.4	0.233	1318.7	0.518	0.9999	773.	669.	0.00580	0.81	1.00	0.92	3.81	-0.231	0.10
16.00	203.5	186.3	0.205	1494.8	0.575	0.9999	788.	684.	0.00575	0.79	0.94	0.89	3.67	-0.252	0.09
RUN 36-1031 WEIGHT FLOW, 0.1070 HEAT INPUT, 36.22 INLET BULK TEMP, 72.0 OUTLET BULK TEMP, 154.1 PLOT CH +															
2.00	333.5	77.8	1.173	345.6	0.202	0.5804	984.	885.	0.00366	0.64	0.71	1.34	11.39	-0.014	0.21
3.50	328.0	83.6	0.963	420.9	0.234	0.6873	886.	787.	0.00417	0.70	0.81	1.22	9.41	-0.024	0.20
5.00	321.2	90.6	0.805	503.5	0.266	0.7709	790.	685.	0.00490	0.75	0.91	1.13	7.56	-0.041	0.19
6.50	314.4	98.5	0.686	591.1	0.297	0.8330	733.	625.	0.00552	0.79	0.99	1.07	6.34	-0.062	0.19
7.25	309.0	102.7	0.633	640.4	0.314	0.8581	706.	596.	0.00588	0.81	1.03	1.06	5.80	-0.075	0.19
8.00	304.4	107.0	0.587	690.0	0.330	0.8792	700.	589.	0.00601	0.81	1.05	1.03	5.51	-0.086	0.18
8.75	299.0	111.3	0.547	741.6	0.348	0.8969	666.	553.	0.00654	0.84	1.10	1.04	4.97	-0.104	0.18
10.00	290.9	118.6	0.489	828.1	0.378	0.9201	656.	543.	0.00682	0.84	1.11	1.01	4.58	-0.127	0.18
11.50	280.7	127.6	0.431	939.9	0.416	0.9412	649.	536.	0.00708	0.83	1.10	0.98	4.20	-0.155	0.17
13.00	269.6	136.8	0.381	1063.0	0.457	0.9568	654.	541.	0.00715	0.81	1.08	0.94	3.95	-0.180	0.15
14.50	257.6	146.0	0.338	1198.8	0.502	0.9682	655.	542.	0.00730	0.80	1.06	0.91	3.71	-0.208	0.14
16.00	244.7	154.7	0.301	1345.3	0.552	0.9999	668.	555.	0.00722	0.78	1.01	0.88	3.59	-0.229	0.13
RUN 37-1033 WEIGHT FLOW, 0.1220 HEAT INPUT, 35.49 INLET BULK TEMP, 91.2 OUTLET BULK TEMP, 169.0 PLOT CH .															
2.00	598.9	98.3	1.431	323.1	0.151	0.6340	577.	462.	0.00779	1.00	0.91	1.20	4.70	-0.054	0.56
3.50	595.0	104.2	1.277	362.0	0.165	0.7010	629.	517.	0.00689	0.86	0.80	1.05	4.96	-0.063	0.47
5.00	591.0	110.6	1.149	402.1	0.179	0.7555	649.	537.	0.00667	0.81	0.85	0.97	4.86	-0.076	0.42
6.50	587.5	117.2	1.046	442.0	0.193	0.7985	680.	570.	0.00629	0.74	0.81	0.89	4.87	-0.086	0.37
7.25	584.9	120.6	0.998	462.9	0.200	0.8170	674.	564.	0.00643	0.74	0.82	0.88	4.68	-0.096	0.37
8.00	582.7	124.1	0.955	483.9	0.207	0.8334	703.	595.	0.00607	0.70	0.79	0.83	4.79	-0.098	0.34
8.75	580.0	127.7	0.915	505.3	0.214	0.8480	681.	571.	0.00644	0.71	0.81	0.84	4.47	-0.113	0.34
10.00	576.1	133.7	0.854	541.1	0.225	0.9785	684.	574.	0.00647	0.70	0.80	0.81	4.29	-0.128	0.30
11.50	571.0	141.2	0.790	585.1	0.239	0.9955	668.	557.	0.00685	0.70	0.81	0.81	3.95	-0.154	0.30
13.00	564.5	148.4	0.734	629.2	0.253	0.9999	649.	537.	0.00732	0.72	0.83	0.81	3.62	-0.183	0.30
14.50	557.1	155.4	0.686	674.1	0.267	0.9999	625.	512.	0.00796	0.75	0.85	0.83	3.30	-0.221	0.30
16.00	548.8	162.5	0.641	720.9	0.281	0.9999	617.	504.	0.00833	0.75	0.85	0.83	3.10	-0.253	0.30
RUN 39-1017 WEIGHT FLOW, 0.0680 HEAT INPUT, 17.38 INLET BULK TEMP, 100.6 OUTLET BULK TEMP, 172.9 PLOT CH I															
2.00	611.5	107.9	1.240	207.7	0.093	0.7234	397.	336.	0.00608	1.04	0.95	1.15	3.17	-0.126	0.64
3.50	610.1	113.5	1.141	225.7	0.099	0.7657	418.	357.	0.00570	0.95	0.91	1.04	3.15	-0.141	0.58
5.00	608.4	119.4	1.055	244.2	0.105	0.8008	429.	368.	0.00559	0.89	0.90	0.98	3.08	-0.162	0.54
6.50	606.6	125.5	0.980	262.8	0.112	0.8295	439.	379.	0.00549	0.85	0.88	0.92	3.02	-0.184	0.50
7.25	605.2	128.7	0.945	272.5	0.115	0.8418	447.	387.	0.00539	0.82	0.86	0.89	3.01	-0.193	0.48
8.00	604.1	131.8	0.913	282.1	0.118	0.8527	453.	393.	0.00533	0.80	0.85	0.87	2.98	-0.203	0.47
8.75	602.8	135.0	0.883	291.8	0.121	0.8660	450.	389.	0.00548	0.80	0.86	0.87	2.88	-0.221	0.42
10.00	600.8	140.5	0.837	307.9	0.125	0.9999	456.	396.	0.00546	0.78	0.85	0.84	2.82	-0.242	0.41
11.50	598.4	146.9	0.788	326.8	0.131	0.9999	470.	410.	0.00531	0.75	0.82	0.80	2.79	-0.260	0.39
13.00	595.8	153.1	0.746	345.1	0.137	0.9999	482.	422.	0.00520	0.72	0.79	0.78	2.76	-0.278	0.38
14.50	593.0	159.4	0.708	363.6	0.142	0.9999	488.	429.	0.00519	0.71	0.78	0.75	2.69	-0.301	0.37
16.00	590.0	165.7	0.674	382.3	0.148	0.9999	492.	433.	0.00523	0.70	0.76	0.75	2.61	-0.326	0.36
RUN 41-1019 WEIGHT FLOW, 0.0960 HEAT INPUT, 17.33 INLET BULK TEMP, 71.4 OUTLET BULK TEMP, 112.1 PLOT CH ,															
2.00	313.8	74.2	1.231	295.4	0.179	0.5326	425.	366.	0.00476	0.94	0.60	1.20	4.93	-0.029	0.47
3.50	310.7	76.8	1.097	331.6	0.197	0.5977	475.	416.	0.00410	0.76	0.58	1.00	5.42	-0.032	0.37
5.00	307.0	79.7	0.981	370.7	0.214	0.6571	495.	436.	0.00391	0.68	0.59	0.89	5.47	-0.040	0.37
6.50	311.0	83.5	0.903	402.8	0.225	0.7056	497.	439.	0.00393	0.65	0.61	0.84	5.26	-0.050	0.30
7.25	308.1	85.2	0.856	424.7	0.234	0.7298	491.	432.	0.00402	0.65	0.63	0.82	5.07	-0.056	0.29
8.00	298.1	86.7	0.796	456.7	0.249	0.7559	485.	427.	0.00410	0.65	0.65	0.81	4.92	-0.063	0.28
8.75	295.3	88.6	0.757	480.2	0.259	0.7766	465.	405.	0.00438	0.68	0.68	0.83	4.59	-0.074	0.28
10.00	291.2	91.9	0.700	519.8	0.273	0.8072	448.	389.	0.00468	0.70	0.72	0.83	4.23	-0.091	0.27
11.50	285.9	96.2	0.638	569.8	0.291	0.8387	428.	369.	0.00509	0.73	0.77	0.84	3.83	-0.116	0.27
13.00	280.1	100.7	0.584	622.9	0.310	0.8652	417.	357.	0.00541	0.74	0.81	0.84	3.55	-0.141	0.26
14.50	274.1	105.3	0.536	678.8	0.329	0.8875	404.	344.	0.00581	0.76	0.85	0.85	3.27	-0.172	0.25
16.00	267.9	110.0	0.494	736.8	0.349	0.9058	400.	340.	0.00603	0.76	0.87	0.84	3.09	-0.201	0.24
RUN 44-1020 WEIGHT FLOW, 0.1350 HEAT INPUT, 17.29 INLET BULK TEMP, 83.2 OUTLET BULK TEMP, 112.2 PLOT CH 3															
2.00	630.8	85.8	2.039	251.0	0.118	0.4016	260.	195.	0.01262	1.41	0.84	1.47	2.28	-0.053	1.52
3.50	628.2	87.8	1.922	266.1	0.126	0.4427	273.	209.	0.01142	1.28	0.78	1.36	2.38	-0.066	1.36
5.00	625.1	89.8	1.813	282.1	0.134	0.4835	287.	224.	0.01036	1.15	0.74	1.23	2.49	-0.076	1.22
6.50	622.0	91.9	1.711	298.9	0.142	0.5233	293.	230.	0.01004	1.09	0.73	1.17	2.50	-0.090	1.13
7.25	619.5	93.0	1.661	307.8	0.146	0.5430	303.	240.	0.00947	1.03	0.70	1.10	2.58	-0.093	1.06
8.00	617.6	94.1	1.615	316.7	0.149	0.5620	299.	236.	0.00978	1.04	0.72	1.11	2.51	-0.104	1.04
8.75	615.2	95.2	1.569	326.0	0.153	0.5807	295.	231.	0.01018	1.06	0.75	1.13	2.43	-0.117	1.03
10.00	611.6	97.2	1.497	341.7	0.160	0.6104	302.	239.	0.00977	1.00	0.73	1.07	2.46	-0.127	0.96
11.50	607.2	99.6	1.416	361.1	0.167	0.6440	310.	247.	0.00943	0.95	0.72	1.01	2.48	-0.141	0.89
13.00	602.5	102.1	1.341	381.3	0.175	0.6753	317.	254.	0.00913	0.90	0.71	0.96	2.49	-0.154	0.83
14.50	597.5	104.7	1.272	402.2	0.183	0.7042	322.	259.	0.00898	0.87	0.71	0.92	2.48	-0.170	0.78
16.00	592.5	107.5	1.207	423.7	0.191	0.7308	324.	262.	0.00901	0.85	0.71	0.90	2.44	-0.189	0.74

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.251 inch; heated tube length, 18 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XITF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q <sub>DL</sub>	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.08 TEST VOLTAGE, 50.3 HEAT INPUT/UNIT AREA, 2.861 ID, 0.220 OD, 0.251 LENGTH, 18.0														
3192846.	96586.	137587.	0.700	0.684	0.0802	91.761	0.3739	0.4055	0.00804	2.93	0.873	60.1	1.07	3.20
3082672.	160505.	196852.	0.617	0.693	0.0550	51.101	0.3341	0.4039	0.00674	2.90	0.891	70.3	1.10	2.90
2915739.	231698.	264661.	0.597	0.694	0.0391	32.163	0.3097	0.4062	0.00585	2.88	0.888	79.7	1.09	2.74
2739420.	303190.	330092.	0.599	0.681	0.0283	22.512	0.2976	0.4118	0.00519	2.87	0.866	88.0	1.06	2.67
2658998.	344252.	366550.	0.606	0.680	0.0253	18.824	0.2956	0.4131	0.00494	2.86	0.869	92.6	1.06	2.62
2579492.	354944.	375104.	0.612	0.680	0.0218	17.543	0.2950	0.4126	0.00466	2.86	0.840	94.3	1.03	2.64
2504462.	388469.	406049.	0.619	0.680	0.0193	15.236	0.2949	0.4129	0.00444	2.86	0.838	98.2	1.03	2.62
2386076.	410188.	423120.	0.629	0.680	0.0188	13.483	0.2924	0.4123	0.00408	2.86	0.802	101.6	1.00	2.64
2265943.	432307.	432351.	0.643	0.682	0.0081	11.648	0.3036	0.4109	0.00374	2.86	0.769	105.3	0.98	2.67
2161434.	438871.	438911.	0.654	0.689	0.0001	10.860	0.3129	0.4078	0.00345	2.86	0.736	107.9	0.94	2.71
2067757.	453990.	454027.	0.664	0.693	0.0002	9.791	0.3224	0.4059	0.00322	2.86	0.713	111.2	0.92	2.73
1987792.	456864.	456898.	0.671	0.698	0.0002	9.173	0.3323	0.4037	0.00302	2.87	0.688	113.3	0.89	2.77
HEAT BALANCE, 0.12 TEST VOLTAGE, 50.4 HEAT INPUT/UNIT AREA, 2.900 ID, 0.220 OD, 0.251 LENGTH, 18.0														
3983861.	145183.	243006.	0.840	0.691	0.1452	74.720	0.4166	0.4043	0.00708	2.95	0.775	80.4	0.90	2.91
4005671.	205934.	293304.	0.698	0.697	0.1030	51.463	0.3768	0.4051	0.00611	2.93	0.786	88.5	0.93	2.76
3936185.	298862.	381213.	0.631	0.679	0.0767	34.283	0.3476	0.4140	0.00547	2.92	0.795	98.7	0.94	2.63
3811209.	386560.	457856.	0.602	0.682	0.0579	24.753	0.3263	0.4157	0.00491	2.91	0.800	107.8	0.94	2.54
3742939.	436742.	502826.	0.596	0.682	0.0506	21.087	0.3175	0.4144	0.00470	2.90	0.806	112.6	0.95	2.49
3667793.	466114.	524494.	0.593	0.683	0.0439	19.118	0.3101	0.4142	0.00445	2.90	0.795	115.6	0.94	2.48
3595331.	532296.	587625.	0.594	0.683	0.0394	15.984	0.3059	0.4121	0.00432	2.89	0.813	121.7	0.96	2.41
3472451.	584272.	623699.	0.600	0.684	0.0322	13.741	0.3020	0.4116	0.00402	2.89	0.800	126.9	0.96	2.40
3328677.	636676.	671595.	0.610	0.684	0.0257	11.848	0.2976	0.4115	0.00369	2.89	0.780	132.4	0.94	2.40
3192495.	668000.	693862.	0.621	0.684	0.0207	10.570	0.2991	0.4121	0.00339	2.89	0.750	136.5	0.91	2.43
3067947.	702256.	721357.	0.632	0.684	0.0172	9.465	0.3009	0.4125	0.00314	2.89	0.729	140.8	0.90	2.45
2969654.	711941.	712009.	0.643	0.683	0.0001	8.909	0.3064	0.4136	0.00293	2.89	0.699	143.2	0.88	2.51
HEAT BALANCE, 0.04 TEST VOLTAGE, 49.7 HEAT INPUT/UNIT AREA, 2.856 ID, 0.220 OD, 0.251 LENGTH, 18.0														
3658806.	595633.	862270.	0.723	0.668	0.2339	13.840	0.3929	0.4193	0.00506	2.83	0.823	139.1	0.92	2.24
3658170.	599354.	749417.	0.666	0.671	0.1738	14.981	0.3691	0.4204	0.00442	2.84	0.746	135.4	0.85	2.38
3621245.	575802.	624553.	0.630	0.672	0.1379	14.336	0.3591	0.4211	0.00398	2.85	0.709	136.8	0.83	2.44
3561429.	570175.	684898.	0.609	0.672	0.1117	14.264	0.3533	0.4223	0.00360	2.85	0.664	136.6	0.79	2.53
3527115.	599187.	709028.	0.603	0.672	0.1036	13.290	0.3509	0.4221	0.00347	2.85	0.660	139.4	0.79	2.52
3487488.	575865.	666718.	0.598	0.673	0.0937	13.789	0.3489	0.4234	0.00329	2.86	0.629	137.7	0.76	2.60
3450407.	627582.	714440.	0.594	0.673	0.0891	12.257	0.3471	0.4225	0.00321	2.85	0.639	142.5	0.77	2.55
3381368.	652937.	664045.	0.592	0.673	0.0142	11.400	0.3448	0.4227	0.00302	2.85	0.623	145.4	0.80	2.61
3296538.	716313.	716301.	0.592	0.673	0.0005	9.871	0.3428	0.4222	0.00285	2.85	0.623	151.7	0.81	2.59
3216927.	785400.	785465.	0.596	0.673	0.0002	8.526	0.3436	0.4215	0.00271	2.85	0.630	158.4	0.81	2.56
3141807.	868328.	868394.	0.602	0.673	0.0002	7.275	0.3463	0.4206	0.00261	2.84	0.647	166.0	0.83	2.52
3068996.	919463.	919526.	0.609	0.674	0.0002	6.553	0.3492	0.4202	0.00249	2.84	0.650	171.2	0.83	2.51
HEAT BALANCE, 0.02 TEST VOLTAGE, 34.4 HEAT INPUT/UNIT AREA, 1.394 ID, 0.220 OD, 0.251 LENGTH, 18.0														
2010788.	574068.	728687.	0.648	0.649	0.1984	6.732	0.3640	0.3950	0.00438	1.37	0.815	107.0	0.97	1.92
1987652.	564559.	686872.	0.624	0.655	0.1633	6.788	0.3583	0.4017	0.00396	1.37	0.762	106.4	0.91	2.00
1756830.	574700.	674404.	0.609	0.659	0.1392	6.512	0.3540	0.4059	0.00364	1.39	0.734	107.5	0.88	2.05
1920850.	583120.	665163.	0.599	0.662	0.1213	6.241	0.3506	0.4101	0.00335	1.39	0.708	108.7	0.85	2.11
1901980.	581665.	653614.	0.596	0.663	0.1137	6.186	0.3492	0.4130	0.00327	1.39	0.691	108.9	0.83	2.14
1882252.	583410.	650533.	0.594	0.665	0.1076	6.082	0.3481	0.4153	0.00309	1.39	0.677	109.3	0.81	2.17
1862232.	603301.	609119.	0.593	0.665	0.0118	5.738	0.3471	0.4151	0.00301	1.39	0.681	111.2	0.86	2.21
1828163.	611562.	611610.	0.592	0.667	0.0002	5.502	0.3458	0.4182	0.00283	1.37	0.665	112.5	0.84	2.25
1788600.	608410.	608461.	0.594	0.668	0.0002	5.424	0.3463	0.4192	0.00265	1.40	0.637	113.1	0.80	2.30
1751241.	606348.	606390.	0.598	0.669	0.0002	5.335	0.3488	0.4194	0.00250	1.40	0.614	113.8	0.78	2.34
1714665.	612786.	612825.	0.603	0.670	0.0002	5.134	0.3517	0.4195	0.00237	1.40	0.601	115.1	0.76	2.36
1679090.	623201.	623237.	0.609	0.670	0.0002	4.887	0.3548	0.4197	0.00226	1.40	0.592	116.9	0.75	2.38
HEAT BALANCE, 0.08 TEST VOLTAGE, 34.3 HEAT INPUT/UNIT AREA, 1.393 ID, 0.220 OD, 0.251 LENGTH, 18.0														
3627318.	446233.	782395.	0.946	0.675	0.2598	18.940	0.4198	0.3735	0.00549	1.39	0.689	112.1	0.77	1.76
3679875.	408710.	651668.	0.820	0.681	0.1923	21.664	0.4117	0.3904	0.00475	1.39	0.625	106.9	0.69	1.94
3698207.	418313.	613654.	0.736	0.684	0.1498	21.536	0.3980	0.3974	0.00427	1.39	0.597	106.4	0.66	2.02
3654220.	451080.	619863.	0.683	0.684	0.1244	19.511	0.3699	0.3995	0.00391	1.39	0.583	108.5	0.65	2.05
3643928.	478820.	637917.	0.662	0.684	0.1125	18.164	0.3610	0.3978	0.00378	1.39	0.584	110.5	0.66	2.03
3654802.	505751.	652886.	0.643	0.684	0.0991	17.065	0.3510	0.3960	0.00367	1.39	0.587	112.2	0.67	2.01
3632549.	560313.	705851.	0.630	0.683	0.0916	14.787	0.3435	0.3900	0.00361	1.39	0.605	116.2	0.69	1.94
3585243.	629118.	763684.	0.614	0.682	0.0797	12.610	0.3324	0.3852	0.00346	1.39	0.617	121.0	0.71	1.89
3519391.	717369.	840256.	0.603	0.680	0.0678	10.520	0.3211	0.3797	0.00331	1.39	0.635	127.1	0.74	1.83
3446986.	740225.	899306.	0.597	0.680	0.0576	9.106	0.3115	0.3769	0.00314	1.39	0.644	132.2	0.76	1.80
3370254.	870253.	967361.	0.595	0.679	0.0494	7.845	0.3035	0.3738	0.00300	1.39	0.660	137.7	0.78	1.77
3293233.	922817.	100801.	0.598	0.680	0.0423	7.072	0.2980	0.3736	0.00284	1.39	0.661	141.6	0.79	1.77
HEAT BALANCE, -0.03 TEST VOLTAGE, 34.1 HEAT INPUT/UNIT AREA, 1.387 ID, 0.220 OD, 0.251 LENGTH, 18.0														
3648996.	1530611.	2686001.	0.950	0.593	0.8044	4.070	0.4109	0.3486	0.00383	1.38	0.790	216.6	0.92	1.52
3752630.	1491424.	2489862.	0.911	0.595	0.6710	4.412	0.4132	0.3496	0.00364	1.38	0.740	211.8	0.88	1.54
3838482.	1433367.	2303751.	0.872	0.600	0.5625	4.765	0.4083	0.3532	0.00344	1.39	0.695	207.1	0.83	1.56
3906217.	1444140.	2220732.	0.831	0.604	0.4830	4.811	0.4023	0.3551	0.00328	1.39	0.681	206.7	0.82	1.57
3936266.	1402259.	2117747.	0.811	0.608	0.4422	5.066	0.3991	0.3577	0.00318	1.39	0.656	203.7	0.79	1.59
3960369.	1457844.	2150100.	0.792	0.607	0.4165	4.827	0.3958	0.3568	0.00314	1.39	0.670	206.5	0.82	1.58
3982099.	1522142.	2171793.	0.773	0.606	0.3931	4.587	0.3924	0.3557	0.00309	1.39	0.688	209.7	0.84	1.57
4007264.	1509300.	2111432.	0.744	0.610	0.3480	4.675	0.3869	0.3581	0.00296	1.39	0.668	208.3	0.82	1.59
4029715.	1507544.	2039898.	0.713	0.614	0.3035	4.710	0.3804	0.3606	0.00283	1.39	0.650	207.6	0.80	1.61
4039757.	1506369.	1977208.	0.686	0.618	0.2662	4.778	0.3742	0.3631	0.00270	1.39	0.633	207.2	0.78	1.63
4039870.	1520440.	1938808.	0.663	0.622	0.2356	4.669	0.3664	0.3654	0.00257	1.39	0.622	207.7	0.77	1.65
4031797.	1533093.	1929835.	0.644	0.625	0.2106	4.574	0.3629	0.3668	0.00246	1.39	0.619	209.4	0.77	1.67

TABLE IV. - Continued. UNIFORMLY

(e) Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	P <sub>0</sub>	T <sub>0</sub>	R <sub>03</sub>	VELOC	M	X2	T <sub>0</sub>	T <sub>w</sub>	H	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM
RUN 1- 574	WEIGHT FLOW,	R <sub>03</sub>	VELOC	M <td>X2</td> <td>T<sub>0</sub></td> <td>T<sub>w</sub></td> <td>H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td> </td>	X2	T <sub>0</sub>	T <sub>w</sub>	H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td>	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM	
	26.31	44.6	57.6	26.31	44.6	57.6	26.31	44.6	57.6	26.31	44.6	57.6	26.31	44.6	57.6
2.50	292.4	51.4	3.908	173.8	0.056	0.0176	447.	448.	0.00468	1.41	0.74	1.96	8.73	0.034	3.12
4.50	266.7	55.7	3.607	188.2	0.069	0.0313	674.	623.	0.00331	0.90	0.51	1.59	11.19	0.016	2.25
6.50	283.7	59.0	3.280	207.0	0.087	0.0519	633.	632.	0.00328	0.79	0.42	1.50	10.71	0.010	1.70
8.50	277.6	61.4	2.926	232.1	0.114	0.0822	634.	633.	0.00329	0.70	0.34	1.40	10.31	0.005	1.25
9.50	274.1	62.2	2.741	247.8	0.131	0.1019	550.	550.	0.00384	0.78	0.33	1.44	8.84	0.004	1.17
10.50	270.2	62.8	2.550	266.3	0.153	0.1255	535.	535.	0.00396	0.76	0.29	1.39	8.52	0.002	1.01
11.50	266.1	63.2	2.356	288.3	0.177	0.1538	546.	546.	0.00387	0.69	0.26	1.31	8.64	0.001	0.85
13.50	257.2	63.7	1.983	342.4	0.228	0.2209	520.	520.	0.00409	0.65	0.26	1.20	8.17	-0.001	0.64
15.50	246.8	64.0	1.644	413.0	0.287	0.3018	504.	504.	0.00424	0.61	0.27	1.09	7.88	-0.002	0.48
17.50	235.3	64.4	1.351	502.6	0.352	0.3935	486.	486.	0.00441	0.58	0.32	0.98	7.55	-0.005	0.38
19.50	223.1	65.2	1.106	613.3	0.425	0.4895	493.	493.	0.00435	0.53	0.37	0.87	7.56	-0.008	0.29
21.50	206.7	66.4	0.893	760.2	0.516	0.5867	463.	464.	0.00468	0.53	0.43	0.82	6.98	-0.013	0.24
RUN 4- 569	WEIGHT FLOW,	R <sub>03</sub>	VELOC	M <td>X2</td> <td>T<sub>0</sub></td> <td>T<sub>w</sub></td> <td>H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td> </td>	X2	T <sub>0</sub>	T <sub>w</sub>	H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td>	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM	
	15.75	47.1	67.3	15.75	47.1	67.3	15.75	47.1	67.3	15.75	47.1	67.3	15.75	47.1	67.3
2.50	225.6	52.5	3.751	119.1	0.042	0.0191	335.	237.	0.00597	2.95	0.84	3.48	4.52	0.052	3.26
4.50	223.6	55.8	3.461	129.0	0.052	0.0315	433.	339.	0.00391	1.75	0.56	2.39	6.08	0.022	2.53
6.50	220.9	58.3	3.145	142.0	0.066	0.0498	506.	414.	0.00313	1.19	0.40	1.90	7.10	0.010	1.87
8.50	217.7	59.8	2.800	159.5	0.086	0.0769	511.	419.	0.00311	1.05	0.31	1.74	6.99	0.005	1.43
9.50	215.9	60.3	2.618	170.6	0.101	0.0949	443.	347.	0.00383	1.30	0.28	1.95	5.80	0.004	1.38
10.50	213.9	60.5	2.430	183.8	0.118	0.1168	434.	339.	0.00397	1.28	0.22	1.91	5.61	0.003	1.22
11.50	211.8	60.6	2.242	199.2	0.135	0.1426	442.	348.	0.00386	1.15	0.19	1.76	5.74	0.003	1.04
13.50	207.1	60.6	1.888	236.6	0.172	0.2035	419.	324.	0.00420	1.14	0.18	1.68	5.35	0.002	0.82
15.50	202.3	60.5	1.574	283.8	0.214	0.2780	402.	307.	0.00449	1.11	0.22	1.56	5.07	0.002	0.65
17.50	197.1	60.7	1.307	341.8	0.257	0.3630	385.	290.	0.00482	1.09	0.32	1.46	4.77	0.000	0.53
19.50	191.0	61.3	1.086	411.4	0.305	0.4532	390.	295.	0.00473	0.96	0.39	1.28	4.81	-0.004	0.42
21.50	183.7	62.4	0.903	494.7	0.357	0.5440	371.	274.	0.00521	0.98	0.49	1.23	4.39	-0.011	0.36
RUN 5- 856	WEIGHT FLOW,	R <sub>03</sub>	VELOC	M <td>X2</td> <td>T<sub>0</sub></td> <td>T<sub>w</sub></td> <td>H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td> </td>	X2	T <sub>0</sub>	T <sub>w</sub>	H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td>	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM	
	47.10	50.7	184.0	47.10	50.7	184.0	47.10	50.7	50.7	184.0	50.7	184.0	47.10	50.7	184.0
2.50	431.1	64.3	3.158	148.5	0.062	0.0833	1180.	944.	0.00376	1.02	0.78	2.26	15.00	0.008	1.21
4.50	425.1	70.2	2.387	196.4	0.103	0.2190	1000.	783.	0.00469	0.99	0.67	1.96	11.08	0.000	0.70
6.50	417.3	76.2	1.742	269.2	0.151	0.4022	911.	688.	0.00544	0.93	0.72	1.60	9.03	-0.009	0.46
8.50	407.0	83.3	1.289	363.8	0.198	0.5860	864.	635.	0.00601	0.88	0.82	1.34	7.62	-0.024	0.34
9.50	402.2	87.8	1.124	417.4	0.221	0.6634	845.	614.	0.00630	0.87	0.87	1.25	6.99	-0.034	0.31
10.50	398.1	92.9	0.987	475.0	0.243	0.7290	784.	545.	0.00730	0.94	0.97	1.24	5.86	-0.052	0.30
11.50	389.5	98.5	0.874	536.4	0.266	0.7834	833.	501.	0.00659	0.82	0.94	1.10	6.10	-0.058	0.26
13.50	375.1	110.9	0.701	668.9	0.311	0.8624	759.	517.	0.00811	0.90	1.07	1.08	4.66	-0.104	0.25
15.50	360.0	124.0	0.579	810.1	0.360	0.9112	803.	566.	0.00746	0.79	1.00	0.95	4.57	-0.127	0.21
17.50	342.2	137.7	0.483	970.7	0.413	0.9426	804.	567.	0.00769	0.77	0.98	0.89	4.12	-0.164	0.19
19.50	322.1	151.2	0.408	1149.9	0.472	0.9999	814.	579.	0.00772	0.74	0.94	0.84	3.83	-0.199	0.16
21.50	295.1	164.3	0.341	1377.2	0.551	0.9999	846.	615.	0.00734	0.69	0.86	0.79	3.74	-0.220	0.14
RUN 6- 850	WEIGHT FLOW,	R <sub>03</sub>	VELOC	M <td>X2</td> <td>T<sub>0</sub></td> <td>T<sub>w</sub></td> <td>H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td> </td>	X2	T <sub>0</sub>	T <sub>w</sub>	H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td>	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM	
	45.90	47.4	142.8	45.90	47.4	142.8	45.90	47.4	47.4	142.8	47.4	142.8	45.90	47.4	142.8
2.50	464.5	59.7	3.595	168.0	0.059	0.0481	1053.	842.	0.00420	1.08	0.83	1.94	14.10	0.016	2.00
4.50	458.5	66.4	3.026	179.5	0.085	0.1119	948.	733.	0.00490	1.01	0.68	1.77	11.04	0.009	1.29
6.50	451.0	71.3	2.457	245.8	0.125	0.2131	863.	639.	0.00571	0.97	0.61	1.60	8.96	0.001	0.87
8.50	441.7	75.5	1.947	310.2	0.169	0.3468	821.	533.	0.00626	0.91	0.62	1.41	7.84	-0.008	0.61
9.50	436.2	77.8	1.729	349.2	0.193	0.4190	797.	565.	0.00664	0.90	0.65	1.34	7.26	-0.013	0.54
10.50	429.0	80.1	1.535	393.3	0.216	0.4913	728.	488.	0.00789	0.98	0.73	1.34	6.08	-0.022	0.52
11.50	421.7	82.9	1.368	441.5	0.240	0.5598	772.	537.	0.00711	0.85	0.72	1.19	6.48	-0.027	0.42
13.50	407.5	89.4	1.101	548.6	0.287	0.6789	697.	451.	0.00883	0.92	0.85	1.16	5.06	-0.053	0.39
15.50	390.7	97.2	0.897	672.8	0.336	0.7721	735.	495.	0.00808	0.80	0.84	1.00	5.09	-0.070	0.31
17.50	371.2	106.1	0.739	817.3	0.389	0.8416	729.	488.	0.00841	0.77	0.89	0.93	4.60	-0.098	0.27
19.50	348.2	115.4	0.613	984.7	0.452	0.8906	753.	516.	0.00804	0.71	0.87	0.84	4.47	-0.120	0.23
21.50	315.0	125.0	0.499	1211.3	0.539	0.9270	719.	477.	0.00912	0.74	0.93	0.85	3.82	-0.167	0.21
RUN 7- 244	WEIGHT FLOW,	R <sub>03</sub>	VELOC	M <td>X2</td> <td>T<sub>0</sub></td> <td>T<sub>w</sub></td> <td>H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td> </td>	X2	T <sub>0</sub>	T <sub>w</sub>	H <td>H/HHK</td> <td>H/HMW</td> <td>H/HF</td> <td>T<sub>w</sub>/T<sub>0</sub></td> <td>THETA</td> <td>RDFM</td>	H/HHK	H/HMW	H/HF	T <sub>w</sub> /T <sub>0</sub>	THETA	RDFM	
	34.10	53.1	164.6	34.10	53.1	164.6	34.10	53.1	53.1	164.6	53.1	164.6	34.10	53.1	164.6
2.50	475.7	65.1	3.200	118.3	0.047	0.0913	904.	731.	0.00364	1.15	0.79	1.93	11.24	0.012	1.51
4.50	473.6	71.5	2.546	148.7	0.073	0.2011	905.	732.	0.00367	0.93	0.63	1.64	10.24	0.002	0.86
6.50	470.9	77.1	1.971	192.1	0.102	0.3544	757.	564.	0.00492	1.01	0.70	1.50	7.32	-0.009	0.66
8.50	467.7	83.4	1.537	246.3	0.130	0.5160	715.	523.	0.00543	0.96	0.77	1.31	6.27	-0.024	0.50
9.50	465.9	87.2	1.369	276.5	0.144	0.5893	672.	476.	0.00613	1.00	0.84	1.28	5.46	-0.038	0.48
10.50	463.8	91.5	1.228	308.3	0.156	0.6543	636.	437.	0.00688	1.04	0.92	1.27	4.78	-0.055	0.46
11.50	461.5	96.1	1.109	341.4	0.169	0.7107	679.	484.	0.00615	0.90	0.88	1.12	5.03	-0.061	0.39
13.50	456.4	106.6	0.921	411.3	0.192	0.7994	690.	496.	0.00612	0.83	0.90	1.00	4.66	-0.088	0.34
15.50	450.9	117.7	0.786	482.0	0.216	0.8590	637.	438.	0.00742	0.89	0.99	1.01	3.72	-0.143	0.30
17.50	444.7	129.5	0.682	555.0	0.239	0.8995	653.	455.	0.00730	0.83	0.96	0.93	3.52	-0.177	0.30
19.50	438.1	141.7	0.601	630.3	0.262	0.9900	629.	429.	0.00826	0.87	1.01	0.95	3.03	-0.245	0.28
21.50	431.2	153.5	0.538	703.4	0.284	0.9999	636.								

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-b	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	FLUX	DDCL	H/H-H	SMPLR	NU/NUT	TOLK
HEAT BALANCE, -0.04 TEST VOLTAGE, 35.4 HEAT INPUT/UNIT AREA, 1.868 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1684772.	169020.	2426260.	1.231	0.683	9.2165	26.886	0.2850	0.3914	0.01244	1.86	0.628	143.3	0.24	1.88
2052245.	107872.	1544240.	1.316	0.683	4.5734	53.034	0.3304	0.4127	0.00992	1.88	0.478	126.5	0.22	2.10
2523471.	113107.	1263511.	1.488	0.683	2.8076	61.782	0.3306	0.4133	0.00892	1.88	0.445	129.3	0.25	2.19
3111826.	123208.	1040169.	1.829	0.683	1.7911	69.660	0.4719	0.4134	0.00772	1.88	0.414	131.8	0.28	2.27
3448101.	160716.	1131711.	2.131	0.685	1.5493	57.863	0.5252	0.4080	0.00763	1.87	0.441	142.4	0.32	2.14
3809687.	177277.	1072874.	2.702	0.686	1.2635	57.641	0.6006	0.4070	0.00732	1.87	0.446	145.0	0.35	2.13
4189389.	183208.	958713.	3.272	0.686	1.0042	61.495	0.6699	0.4076	0.00691	1.67	0.443	144.0	0.36	2.17
4921622.	225905.	883315.	3.108	0.687	0.6789	58.120	0.6867	0.4056	0.00622	1.87	0.458	148.0	0.42	2.15
5576064.	274396.	824562.	2.729	0.687	0.4629	53.947	0.6718	0.4042	0.00554	1.86	0.471	150.8	0.46	2.13
6120344.	336316.	800447.	1.768	0.688	0.3199	48.024	0.5745	0.4026	0.00493	1.86	0.486	154.0	0.50	2.10
6545009.	380756.	745532.	1.204	0.688	0.2180	45.424	0.4913	0.4027	0.00432	1.86	0.484	153.9	0.51	2.12
6892557.	478479.	792516.	0.908	0.689	0.1525	37.593	0.4265	0.3975	0.00392	1.86	0.503	160.2	0.55	2.03
HEAT BALANCE, -0.04 TEST VOLTAGE, 27.1 HEAT INPUT/UNIT AREA, 1.108 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1234523.	233251.	2546009.	1.290	0.637	10.4784	12.250	0.3093	0.2946	0.01634	1.10	0.740	142.4	0.34	1.68
1490477.	145091.	1729372.	1.439	0.674	5.4878	25.386	0.3612	0.3458	0.01338	1.11	0.559	122.8	0.30	1.70
1816331.	116237.	1247887.	1.764	0.685	3.2112	40.445	0.4364	0.3784	0.01142	1.11	0.478	113.6	0.29	1.81
2221944.	125719.	1061929.	2.595	0.686	2.0945	45.772	0.5604	0.3805	0.00940	1.11	0.435	114.5	0.32	1.83
2454211.	174050.	1222158.	3.827	0.678	1.8582	34.575	0.6819	0.3528	0.00941	1.11	0.480	125.7	0.39	1.65
2704286.	193849.	1181408.	7.073	0.676	1.5227	33.971	0.9026	0.3476	0.00901	1.11	0.492	127.8	0.43	1.61
2961975.	200730.	1072708.	8.753	0.678	1.2179	36.119	1.0113	0.3518	0.00847	1.11	0.490	126.3	0.45	1.62
3449955.	258516.	1048790.	9.638	0.674	0.8482	32.182	1.0949	0.3391	0.00767	1.11	0.522	130.9	0.53	1.53
3882170.	328513.	1033107.	6.370	0.670	0.5954	28.169	0.9541	0.3295	0.00687	1.11	0.554	134.4	0.60	1.44
4240850.	419384.	1050569.	2.701	0.666	0.4251	23.771	0.6871	0.3202	0.00614	1.10	0.589	138.6	0.68	1.36
4521203.	476023.	985613.	1.549	0.668	0.2964	22.368	0.5479	0.3225	0.00540	1.10	0.594	138.0	0.70	1.37
4728082.	608485.	1068222.	1.073	0.664	0.2173	17.883	0.4612	0.3121	0.00490	1.10	0.635	144.4	0.77	1.28
HEAT BALANCE, -0.02 TEST VOLTAGE, 47.7 HEAT INPUT/UNIT AREA, 3.297 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1841070.	61486.	482861.	1.341	0.687	1.6439	83.917	0.3905	0.4051	0.01327	3.38	0.806	81.3	0.50	2.69
2715579.	109484.	420620.	1.493	0.694	0.7171	67.053	0.4849	0.4075	0.01072	3.35	0.826	94.5	0.71	2.61
3372710.	180189.	410433.	1.158	0.677	0.3506	49.848	0.4654	0.4167	0.00848	3.33	0.840	104.7	0.86	2.58
3649812.	263868.	429155.	0.809	0.679	0.1890	35.761	0.4078	0.4182	0.00674	3.32	0.840	114.0	0.93	2.53
3678351.	311079.	451776.	0.714	0.680	0.1442	30.056	0.3840	0.4172	0.00609	3.31	0.835	119.1	0.94	2.50
3659405.	409186.	543664.	0.654	0.680	0.1172	21.868	0.3642	0.4137	0.00571	3.30	0.872	130.0	1.00	2.36
3606911.	389659.	489371.	0.619	0.680	0.0872	22.859	0.3477	0.4167	0.00502	3.31	0.797	127.4	0.93	2.50
3445603.	561341.	639459.	0.591	0.681	0.0605	13.449	0.3245	0.4124	0.00445	3.29	0.832	145.8	0.98	2.34
3261442.	557334.	604390.	0.595	0.681	0.0405	14.149	0.3157	0.4154	0.00374	3.30	0.740	147.2	0.89	2.48
3079206.	614898.	645927.	0.608	0.681	0.0299	11.137	0.3118	0.4157	0.00329	3.30	0.705	155.1	0.86	2.51
2917488.	647353.	647414.	0.625	0.681	0.0001	9.800	0.3146	0.4157	0.00294	3.30	0.667	160.8	0.84	2.57
2780102.	638616.	638671.	0.643	0.679	0.0001	9.413	0.3214	0.4134	0.00266	3.31	0.617	162.6	0.79	2.65
HEAT BALANCE, -0.03 TEST VOLTAGE, 47.0 HEAT INPUT/UNIT AREA, 3.216 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1814786.	92952.	982973.	1.238	0.694	3.2970	54.161	0.3254	0.4058	0.01058	3.29	0.711	102.6	0.36	2.35
2543913.	135238.	826307.	1.327	0.678	1.5654	51.370	0.4044	0.4154	0.00946	3.26	0.692	116.0	0.47	2.43
3370777.	199842.	751134.	1.413	0.678	0.8463	44.708	0.4693	0.4191	0.00822	3.25	0.711	128.7	0.59	2.41
4064503.	274187.	694316.	1.220	0.678	0.4800	38.399	0.4680	0.4167	0.00700	3.24	0.723	137.6	0.70	2.38
4311183.	325577.	701497.	1.098	0.679	0.3733	33.807	0.4551	0.4153	0.00648	3.23	0.735	143.0	0.75	2.35
4496531.	443668.	826813.	0.961	0.679	0.3084	24.929	0.4354	0.4117	0.00621	3.22	0.792	156.2	0.83	2.19
4618071.	423426.	710003.	0.845	0.679	0.2296	27.224	0.4147	0.4137	0.00552	3.23	0.739	151.4	0.80	2.31
4707089.	617051.	895855.	0.697	0.679	0.1590	17.397	0.3792	0.4097	0.00498	3.21	0.800	171.2	0.89	2.15
4663658.	647115.	814362.	0.625	0.681	0.1011	17.014	0.3512	0.4112	0.00416	3.22	0.728	170.7	0.84	2.26
4542952.	744361.	866802.	0.595	0.682	0.0696	14.029	0.3288	0.4105	0.00366	3.22	0.707	179.5	0.83	2.26
4392305.	762391.	844284.	0.592	0.682	0.0478	13.154	0.3160	0.4117	0.00320	3.22	0.695	182.2	0.78	2.34
4244203.	922030.	984410.	0.602	0.684	0.0344	10.027	0.3066	0.4088	0.00296	3.21	0.674	197.1	0.81	2.27
HEAT BALANCE, -0.03 TEST VOLTAGE, 39.3 HEAT INPUT/UNIT AREA, 2.377 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1443101.	83723.	576768.	1.287	0.676	1.9508	47.153	0.3794	0.4163	0.01135	2.42	0.754	79.1	0.47	2.38
2021576.	102966.	410222.	1.347	0.679	0.8632	52.920	0.4536	0.4151	0.00937	2.42	0.716	82.9	0.59	2.54
2499660.	193083.	473395.	1.159	0.677	0.4940	32.982	0.4569	0.4165	0.00801	2.40	0.788	98.0	0.76	2.33
2750637.	269858.	480673.	0.898	0.677	0.2867	25.128	0.4271	0.4149	0.00664	2.39	0.797	105.9	0.85	2.29
2802597.	341524.	539699.	0.792	0.676	0.2323	19.567	0.4020	0.4132	0.00621	2.38	0.831	113.5	0.91	2.21
2818064.	422117.	606903.	0.717	0.675	0.1914	15.368	0.3845	0.4091	0.00584	2.38	0.865	121.4	0.96	2.12
2806376.	398175.	535122.	0.665	0.677	0.1467	16.452	0.3694	0.4136	0.00516	2.38	0.790	118.2	0.90	2.25
2729509.	445091.	539299.	0.608	0.678	0.0987	14.007	0.3458	0.4143	0.00435	2.39	0.742	122.9	0.87	2.31
2620292.	590669.	669079.	0.591	0.677	0.0766	9.434	0.3347	0.4123	0.00396	2.38	0.766	137.5	0.92	2.20
2500912.	616147.	669963.	0.591	0.678	0.0586	8.462	0.3291	0.4131	0.00345	2.38	0.735	141.4	0.88	2.27
2381945.	718562.	723826.	0.599	0.678	0.0078	6.513	0.3266	0.4123	0.00314	2.38	0.756	152.4	0.94	2.25
2276863.	746143.	746201.	0.611	0.679	0.0007	5.856	0.3309	0.4128	0.00284	2.38	0.730	157.1	0.92	2.30
HEAT BALANCE, -0.01 TEST VOLTAGE, 40.0 HEAT INPUT/UNIT AREA, 2.482 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1822598.	119157.	1279332.	1.260	0.679	3.8896	42.266	0.3264	0.4179	0.00949	2.52	0.601	114.0	0.31	2.18
2401327.	132846.	985713.	1.379	0.679	2.0095	49.396	0.3758	0.4175	0.00861	2.52	0.571	118.9	0.36	2.31
3097399.	176576.	876591.	1.535	0.680	1.1850	46.830	0.4665	0.4156	0.00779	2.51	0.561	128.5	0.45	2.30
3808243.	243677.	832062.	1.578	0.681	0.7306	40.700	0.5073	0.4123	0.00695	2.50	0.606	138.3	0.54	2.24
4114059.	283979.	824529.	1.469	0.681	0.5844	37.290	0.5035	0.4109	0.00654	2.49	0.619	142.8	0.58	2.20
4376037.	380381.	744022.	1.361	0.680	0.4954	28.675	0.4758	0.4041	0.00634	2.48	0.668	154.7	0.66	2.06
4593339.	364974.	804531.	1.212	0.682	0.3776	31.834	0.4786	0.4093	0.00572	2.49	0.634	149.5	0.64	2.17
4893640.	564262.	994118.	0.930	0.677	0.2699	20.518	0.4344	0.3910	0.00529	2.47	0.708	168.1	0.77	1.93
5042421.	573963.	867257.	0.758	0.682	0.1732	21.308	0.3361	0.4033	0.00446	2.48	0.657	164.9	0.72	2.08
5074702.	677852.	909703.	0.665	0.683	0.1203	17.764	0.3646	0.4006	0.00396	2.48	0.655	172.2	0.74	2.05
5040958.	664685.	818625.	0.618	0.685	0.0788	18.182	0.3377	0.4068	0.00340	2.49	0.597	169.6	0.68	2.19
4950391.	776860.	697332.	0.599	0.686	0.0554	14.870	0.3157	0.4051	0.00309	2.48	0.597	179.0	0.69	2

TABLE IV. - Continued. UNIFORMLY

(e) Continued. Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	PB	Tb	ROU	VFLOC	M	X2	TQ	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	ROFM
RUN 9-	245	WEIGHT FLOW,	0.1270	HEAT INPUT,	34.10	INLET BULK TEMP,	49.1	OUTLET BULK TEMP,	99.9	PLOT CH *					
2.50	463.6	57.5	3.740	176.1	0.058	0.0366	546.	351.	0.00814	1.78	1.01	2.00	6.11	0.051	3.03
4.50	459.9	62.7	3.366	195.7	0.075	0.0697	731.	553.	0.00495	1.03	0.64	1.47	8.81	0.020	2.00
6.50	455.7	66.9	2.975	221.4	0.076	0.1188	691.	509.	0.00546	1.00	0.57	1.41	7.62	0.012	1.53
8.50	451.0	70.2	2.587	254.7	0.125	0.1853	654.	469.	0.00605	0.97	0.52	1.34	6.68	0.004	1.20
9.50	448.6	71.7	2.398	274.8	0.142	0.2258	609.	420.	0.00690	1.05	0.54	1.33	5.86	0.000	1.12
10.50	445.9	73.1	2.217	297.1	0.158	0.2698	568.	375.	0.00794	1.14	0.57	1.44	5.13	-0.005	1.05
11.50	442.9	74.6	2.048	321.7	0.174	0.3160	605.	416.	0.00705	0.96	0.54	1.26	5.57	-0.009	0.87
13.50	436.4	77.6	1.745	377.5	0.208	0.4131	583.	392.	0.00764	0.94	0.57	1.19	5.05	-0.020	0.72
15.50	428.4	80.9	1.489	442.3	0.242	0.5104	543.	348.	0.00894	1.00	0.65	1.20	4.31	-0.037	0.65
17.50	419.3	84.9	1.278	515.5	0.277	0.6000	550.	355.	0.00884	0.91	0.67	1.08	4.19	-0.053	0.54
19.50	408.4	89.5	1.102	597.8	0.312	0.6788	521.	325.	0.01014	0.96	0.76	1.10	3.63	-0.082	0.51
21.50	396.0	94.6	0.955	689.6	0.350	0.7455	528.	332.	0.01007	0.89	0.78	1.01	3.51	-0.106	0.44
RUN 12-	492	WEIGHT FLOW,	0.1098	HEAT INPUT,	31.41	INLET BULK TEMP,	46.1	OUTLET BULK TEMP,	102.4	PLOT CH C					
2.50	406.3	55.5	3.792	150.2	0.050	0.0297	634.	468.	0.00537	1.49	0.91	1.96	8.44	0.035	2.89
4.50	402.8	61.1	3.382	168.4	0.065	0.0609	729.	571.	0.00438	1.10	0.65	1.67	9.34	0.017	1.98
6.50	398.1	65.2	2.946	193.4	0.088	0.1102	689.	528.	0.00481	1.05	0.56	1.58	8.09	0.009	1.45
8.50	392.3	68.4	2.503	227.6	0.119	0.1815	678.	515.	0.00497	0.94	0.48	1.44	7.54	0.002	1.04
9.50	389.1	69.6	2.288	249.0	0.137	0.2264	591.	422.	0.00628	1.11	0.52	1.54	6.06	-0.001	1.01
10.50	385.7	70.9	2.086	273.1	0.155	0.2751	583.	413.	0.00646	1.08	0.53	1.47	5.83	-0.005	0.87
11.50	382.0	72.2	1.898	300.0	0.174	0.3269	587.	417.	0.00640	1.01	0.53	1.37	5.78	-0.009	0.75
13.50	374.3	74.9	1.572	362.4	0.212	0.4364	573.	402.	0.00675	0.95	0.57	1.25	5.36	-0.019	0.60
15.50	365.5	78.4	1.308	435.4	0.250	0.5432	547.	374.	0.00744	0.95	0.64	1.18	4.78	-0.034	0.51
17.50	356.0	82.7	1.099	518.2	0.289	0.6387	536.	363.	0.00785	0.92	0.71	1.10	4.39	-0.053	0.44
19.50	345.6	87.8	0.932	611.1	0.328	0.7197	549.	376.	0.00764	0.83	0.73	0.98	4.29	-0.071	0.37
21.50	332.5	93.6	0.794	717.6	0.371	0.7803	522.	347.	0.00866	0.86	0.81	0.99	3.71	-0.106	0.35
RUN 18-	489	WEIGHT FLOW,	0.0660	HEAT INPUT,	19.21	INLET BULK TEMP,	48.0	OUTLET BULK TEMP,	88.1	PLOT CH I					
2.50	414.1	55.2	3.820	116.9	0.038	0.0285	344.	245.	0.00710	2.17	1.04	2.39	4.44	0.080	3.39
4.50	412.2	59.7	3.508	127.2	0.047	0.0507	426.	330.	0.00501	1.53	0.72	1.81	5.52	0.039	2.67
6.50	410.0	63.5	3.179	140.3	0.058	0.0832	527.	434.	0.00368	1.03	0.52	1.37	6.83	0.018	1.93
8.50	407.3	66.5	2.840	157.1	0.073	0.1278	534.	441.	0.00364	0.92	0.45	1.26	6.63	0.010	1.49
9.50	406.0	67.7	2.671	167.0	0.082	0.1550	468.	371.	0.00445	1.07	0.47	1.38	5.60	0.007	1.45
10.50	404.4	68.9	2.503	178.2	0.093	0.1860	463.	368.	0.00454	1.04	0.45	1.33	5.34	0.003	1.29
11.50	402.8	70.0	2.339	190.7	0.103	0.2207	459.	363.	0.00463	1.00	0.44	1.28	5.19	-0.000	1.16
13.50	399.4	72.1	2.035	219.2	0.123	0.2966	441.	345.	0.00497	0.98	0.45	1.23	4.78	-0.009	0.96
15.50	395.8	74.3	1.768	252.3	0.145	0.3787	428.	332.	0.00526	0.95	0.48	1.16	4.46	-0.019	0.81
17.50	392.0	76.9	1.540	289.7	0.166	0.4627	416.	319.	0.00559	0.92	0.51	1.10	4.15	-0.031	0.71
19.50	388.0	79.9	1.348	330.9	0.186	0.5430	417.	320.	0.00563	0.86	0.54	1.01	4.01	-0.044	0.61
21.50	383.9	83.4	1.189	375.2	0.206	0.6161	387.	289.	0.00657	0.92	0.62	1.05	3.47	-0.070	0.58
RUN 20-	902	WEIGHT FLOW,	0.1310	HEAT INPUT,	22.15	INLET BULK TEMP,	46.4	OUTLET BULK TEMP,	84.7	PLOT CH K					
2.50	462.9	54.0	3.937	172.6	0.053	0.0239	390.	232.	0.00864	1.71	0.94	1.84	4.31	0.104	3.61
4.50	459.0	57.8	3.712	183.1	0.062	0.0384	444.	290.	0.00668	1.38	0.71	1.55	5.01	0.063	3.12
6.50	455.4	61.2	3.477	195.5	0.072	0.0580	475.	322.	0.00595	1.19	0.69	1.39	5.27	0.042	2.65
8.50	450.8	64.0	3.232	210.3	0.084	0.0836	558.	407.	0.00452	0.87	0.45	1.10	6.39	0.023	2.07
9.50	448.3	65.3	3.107	216.7	0.092	0.0989	545.	396.	0.00472	0.87	0.44	1.10	6.06	0.020	1.92
10.50	445.7	66.5	2.981	228.0	0.100	0.1159	516.	365.	0.00521	0.93	0.44	1.15	5.49	0.018	1.83
11.50	442.9	67.6	2.854	238.1	0.108	0.1346	536.	366.	0.00490	0.84	0.41	1.07	5.71	0.013	1.63
13.50	437.2	69.5	2.603	261.1	0.129	0.1776	480.	327.	0.00602	0.90	0.42	1.17	4.71	0.007	1.50
15.50	431.2	71.2	2.355	288.5	0.152	0.2289	484.	332.	0.00596	0.89	0.39	1.09	4.66	-0.000	1.25
17.50	425.3	72.8	2.122	320.2	0.175	0.2858	473.	320.	0.00628	0.87	0.40	1.06	4.39	-0.008	1.09
19.50	418.6	74.5	1.907	356.4	0.199	0.3464	465.	312.	0.00654	0.85	0.41	1.02	4.18	-0.017	0.95
21.50	410.7	76.1	1.709	397.7	0.225	0.4100	455.	301.	0.00689	0.84	0.43	0.99	3.96	-0.026	0.84
RUN 22-	487	WEIGHT FLOW,	0.1106	HEAT INPUT,	11.60	INLET BULK TEMP,	48.0	OUTLET BULK TEMP,	68.4	PLOT CH M					
2.50	361.2	51.4	3.975	144.3	0.045	0.0182	148.	56.	0.17735	11.09	10.50	11.53	1.09	3.611	4.12
4.50	359.6	53.9	3.831	149.8	0.049	0.0248	149.	58.	0.21898	12.83	12.00	13.35	1.07	3.768	4.03
6.50	357.7	56.2	3.681	155.9	0.054	0.0331	177.	95.	0.02089	1.80	1.37	1.85	1.70	0.299	3.74
8.50	355.5	58.2	3.526	162.7	0.060	0.0433	200.	121.	0.01296	1.86	0.60	1.93	2.08	0.151	3.42
9.50	354.4	59.1	3.447	166.5	0.064	0.0492	168.	84.	0.03260	2.01	1.75	2.07	1.42	0.343	3.64
10.50	353.3	60.0	3.366	170.5	0.067	0.0557	179.	98.	0.02161	2.09	1.20	2.15	1.63	0.203	3.42
11.50	352.1	60.8	3.284	174.7	0.071	0.0627	184.	104.	0.01912	2.04	1.05	2.15	1.70	0.159	3.29
13.50	349.7	62.3	3.118	184.0	0.080	0.0788	188.	108.	0.01784	2.08	0.92	2.16	1.74	0.114	3.08
15.50	347.1	63.6	2.947	194.7	0.091	0.0977	197.	118.	0.01512	1.96	0.75	2.06	1.85	0.071	2.82
17.50	344.4	64.7	2.774	206.8	0.103	0.1137	202.	124.	0.01391	1.87	0.65	1.97	1.92	0.044	2.58
19.50	341.8	65.6	2.600	220.7	0.117	0.1453	230.	154.	0.00930	1.54	0.45	1.66	2.34	0.017	2.16
21.50	339.0	66.4	2.425	236.6	0.133	0.1751	204.	125.	0.01390	1.78	0.57	1.88	1.89	0.011	2.20
RUN 23-	858	WEIGHT FLOW,	0.0959	HEAT INPUT,	47.35	INLET BULK TEMP,	53.2	OUTLET BULK TEMP,	187.4	PLOT CH N					
2.50	704.4	67.9	3.430	145.0	0.050	0.0835	1052.	831.	0.00440	1.07	0.90	1.64	12.25	0.020	1.85
4.50	699.8	76.8	2.838	175.3	0.071	0.1900	1049.	829.	0.00447	0.90	0.74	1.44	13.78	0.008	1.09
6.50	694.7	84.7	2.306	215.8	0.096	0.3314	942.	716.	0.00527	0.87	0.72	1.28	8.46	-0.003	0.78
8.50	688.6	92.8	1.872	265.8	0.121	0.4830	886.	655.	0.00590	0.83	0.75	1.15	7.06	-0.018	0.61
9.50	685.5	97.2	1.694	293.6	0.133	0.5541	863.	628.	0.00624	0.82	0.78	1.07			



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RF-F	KE-F,MN	PR-B	PR-F	ATTF	VIS-RAT	PHI-B	PHI-F	EFLUX	Q <sub>DL</sub>	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.04 TEST VOLTAGE, 39.0 HEAT INPUT/UNIT AREA, 2.396 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1804175.	371449.	2671522.	1.220	0.652	6.6767	11.746	0.3057	0.3721	0.00886	2.39	0.732	167.0	0.41	1.82
2281006.	206143.	1501664.	1.275	0.678	2.8773	29.208	0.3578	0.4150	0.00748	2.42	0.568	139.1	0.34	2.09
2854797.	257894.	1361201.	1.336	0.677	1.7715	28.477	0.4112	0.4132	0.00697	2.42	0.572	149.6	0.41	2.09
3471807.	328451.	1278121.	1.398	0.677	1.1554	26.491	0.4572	0.4115	0.00642	2.41	0.586	159.9	0.48	2.07
3772822.	411503.	1365055.	1.414	0.671	0.9763	22.171	0.4735	0.3978	0.00628	2.40	0.620	170.7	0.55	1.95
4051347.	517406.	1481765.	1.346	0.664	0.8342	18.078	0.4749	0.3851	0.00615	2.40	0.661	182.4	0.63	1.84
4297397.	478507.	1244841.	1.267	0.671	0.6485	21.413	0.4713	0.3970	0.00560	2.40	0.620	174.9	0.60	1.96
4685954.	596028.	1252685.	1.109	0.669	0.4569	18.074	0.4566	0.3906	0.00508	2.40	0.640	183.8	0.67	1.91
4942178.	798033.	1402292.	0.926	0.662	0.3399	13.628	0.4295	0.3781	0.00473	2.39	0.692	199.1	0.77	1.78
5080910.	873193.	1347248.	0.787	0.665	0.2426	12.695	0.4024	0.3810	0.00420	2.39	0.677	201.9	0.77	1.81
5131601.	1074717.	1517371.	0.697	0.660	0.1863	9.778	0.3792	0.3701	0.00392	2.39	0.724	216.7	0.85	1.72
5116178.	1168944.	1498995.	0.642	0.664	0.1382	9.015	0.3593	0.3745	0.00353	2.39	0.705	220.5	0.83	1.76
HEAT BALANCE, -0.01 TEST VOLTAGE, 38.5 HEAT INPUT/UNIT AREA, 2.209 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1514965.	184333.	1862900.	1.228	0.678	6.5543	21.697	0.2996	0.4048	0.01011	2.22	0.682	126.5	0.34	1.93
1963926.	149737.	1261370.	1.314	0.680	3.0196	35.178	0.3596	0.4136	0.00895	2.23	0.590	120.3	0.34	2.10
2530840.	188976.	1109624.	1.442	0.680	1.7577	35.069	0.4272	0.4115	0.00824	2.22	0.592	129.3	0.42	2.11
3163886.	225197.	943212.	1.626	0.661	1.6512	36.332	0.4933	0.4109	0.00735	2.22	0.589	133.9	0.48	2.14
3474209.	326765.	1121747.	1.613	0.676	0.9043	26.135	0.5074	0.3942	0.00729	2.21	0.655	149.4	0.59	1.93
3753955.	364777.	1081842.	1.500	0.675	0.7219	24.942	0.5040	0.3917	0.00686	2.21	0.663	152.3	0.63	1.92
3997384.	389412.	1613763.	1.406	0.676	0.5739	24.909	0.4990	0.3932	0.00639	2.21	0.658	152.9	0.65	1.94
4366547.	481954.	991310.	1.137	0.675	0.3827	21.388	0.4678	0.3890	0.00562	2.21	0.672	158.7	0.71	1.91
4586478.	618336.	1054171.	0.895	0.672	0.2684	16.930	0.4273	0.3810	0.00505	2.20	0.701	168.2	0.78	1.83
4681975.	737633.	1093476.	0.748	0.672	0.1905	14.147	0.3935	0.3782	0.00451	2.20	0.710	175.5	0.81	1.80
4685658.	789272.	1056823.	0.666	0.676	0.1341	13.119	0.3660	0.3832	0.00394	2.20	0.680	177.6	0.78	1.86
4631558.	974844.	1204136.	0.621	0.673	0.1011	10.045	0.3433	0.3751	0.00366	2.20	0.715	190.8	0.84	1.77
HEAT BALANCE, 0.01 TEST VOLTAGE, 29.6 HEAT INPUT/UNIT AREA, 1.358 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1165008.	379278.	2420168.	1.222	0.610	9.6025	6.999	0.2957	0.3267	0.00855	1.35	0.665	143.5	0.41	1.76
1421764.	261178.	1766274.	1.277	0.651	4.8000	12.929	0.3400	0.3596	0.00600	1.35	0.576	128.7	0.37	1.76
1734845.	189650.	1199587.	1.361	0.675	2.5979	23.187	0.3902	0.3971	0.00705	1.36	0.494	115.7	0.33	1.91
2094367.	203872.	1023242.	1.448	0.676	1.6758	25.873	0.4396	0.4000	0.00647	1.36	0.481	117.4	0.36	1.95
2281994.	274345.	1162728.	1.504	0.666	1.4892	19.661	0.4633	0.3801	0.00650	1.36	0.525	128.9	0.44	1.80
2470188.	295751.	1114699.	1.573	0.666	1.2297	19.598	0.4867	0.3790	0.00623	1.36	0.528	130.8	0.47	1.79
2653237.	319973.	1074211.	1.572	0.665	1.0203	19.318	0.4906	0.3777	0.00595	1.36	0.532	132.7	0.49	1.78
2974878.	387769.	1052586.	1.410	0.661	0.7313	17.407	0.4936	0.3704	0.00545	1.36	0.551	138.3	0.55	1.73
3224767.	465155.	1041275.	1.250	0.658	0.5348	15.511	0.4799	0.3653	0.00497	1.35	0.567	143.2	0.61	1.69
3401427.	552944.	1054522.	1.050	0.655	0.3995	13.473	0.4528	0.3605	0.00455	1.35	0.584	148.5	0.66	1.65
3510112.	613658.	1029314.	0.885	0.657	0.2990	12.389	0.4243	0.3621	0.00411	1.35	0.583	151.0	0.67	1.66
3562265.	779479.	1170416.	0.772	0.648	0.2404	9.441	0.3997	0.3494	0.00388	1.35	0.632	162.4	0.75	1.55
HEAT BALANCE, -0.07 TEST VOLTAGE, 29.5 HEAT INPUT/UNIT AREA, 1.557 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1638382.	673280.	3868817.	1.204	0.597	12.2657	5.495	0.2802	0.3299	0.00569	1.54	0.561	204.1	0.34	1.80
1898061.	505747.	3160009.	1.225	0.628	7.0159	8.695	0.3096	0.3471	0.00575	1.55	0.501	189.3	0.31	1.77
2200013.	452571.	2707048.	1.260	0.644	4.4904	11.357	0.3423	0.3607	0.00549	1.55	0.473	184.5	0.31	1.76
2590051.	337165.	1981927.	1.506	0.668	2.7859	18.558	0.3776	0.3927	0.00501	1.56	0.412	167.5	0.28	1.88
2741118.	365042.	1951855.	1.329	0.666	2.3976	18.067	0.3954	0.3889	0.00493	1.56	0.417	172.0	0.30	1.86
2940597.	422765.	2022156.	1.350	0.661	2.1247	16.370	0.4174	0.3804	0.00492	1.56	0.432	180.7	0.33	1.80
3146215.	403423.	1820341.	1.370	0.665	1.7690	18.519	0.4284	0.3865	0.00471	1.56	0.418	177.1	0.33	1.84
3566179.	548526.	2004586.	1.432	0.651	1.4240	14.737	0.4604	0.3649	0.00465	1.55	0.456	195.1	0.41	1.71
3980041.	583608.	1833602.	1.461	0.653	1.0589	15.401	0.4829	0.3669	0.00435	1.55	0.454	196.2	0.43	1.71
4354552.	667296.	1791644.	1.361	0.651	0.8202	14.508	0.4820	0.3621	0.00410	1.55	0.466	202.0	0.47	1.67
4675507.	754002.	1769922.	1.268	0.649	0.6422	13.597	0.4774	0.3586	0.00386	1.55	0.477	207.0	0.51	1.64
4943728.	860466.	1778524.	1.151	0.646	0.5065	12.394	0.4653	0.3541	0.00364	1.55	0.492	212.9	0.55	1.60
HEAT BALANCE, -0.11 TEST VOLTAGE, 23.0 HEAT INPUT/UNIT AREA, 0.816 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1355423.	1430091.	1533581.	1.214	1.222	35.6814	2.730	0.2757	0.2930	0.00172	0.81	9.608	354.3	10.60	1.86
1492489.	1563152.	1698799.	1.237	1.255	26.6464	2.772	0.2949	0.3119	0.00183	0.81	11.075	357.7	12.06	1.85
1645301.	1757345.	4650926.	1.263	1.016	14.0334	1.882	0.3164	0.4503	0.00362	0.82	1.116	284.0	0.58	1.78
1816751.	1221529.	4510369.	1.305	0.655	8.8871	2.873	0.3402	0.3624	0.00413	0.82	0.642	256.2	0.46	1.71
1909591.	2156881.	4517451.	1.311	1.407	10.7317	1.761	0.3530	0.5060	0.00338	0.82	1.508	310.0	0.82	1.76
2007349.	1712693.	4789316.	1.361	0.846	0.1095	2.199	0.3664	0.4176	0.00384	0.82	1.018	299.7	0.66	1.71
2110186.	1584980.	4744687.	1.395	0.754	6.8717	2.456	0.3805	0.3948	0.00396	0.82	0.881	293.4	0.62	1.68
2330259.	1526725.	4678647.	1.473	0.699	5.2898	2.764	0.4101	0.3794	0.00491	0.82	0.795	280.7	0.62	1.64
2568237.	1400705.	4468876.	1.563	0.644	4.0184	3.302	0.4409	0.3569	0.00496	0.82	0.670	271.8	0.59	1.58
2820975.	1358142.	4292424.	1.672	0.622	3.1512	3.731	0.4729	0.3454	0.00403	0.82	0.618	267.2	0.58	1.53
3083087.	1065833.	3587226.	1.835	0.591	2.2783	5.453	0.5091	0.3176	0.00399	0.82	0.471	241.6	0.49	1.45
3350953.	1480335.	4175537.	1.995	0.614	2.0726	3.996	0.5426	0.3399	0.00386	0.82	0.627	269.3	0.64	1.44
HEAT BALANCE, -0.05 TEST VOLTAGE, 47.3 HEAT INPUT/UNIT AREA, 3.297 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1621700.	120594.	780864.	1.152	0.693	2.4145	36.210	0.3376	0.4083	0.00860	3.36	0.781	94.3	0.44	2.39
2224572.	141366.	555632.	1.071	0.692	1.0519	41.088	0.3702	0.4082	0.00737	3.35	0.725	100.5	0.54	2.59
2753800.	216630.	539890.	0.982	0.671	0.5891	32.714	0.4118	0.4207	0.00638	3.33	0.715	113.4	0.66	2.60
3076839.	296010.	542454.	0.946	0.668	0.3579	25.772	0.4011	0.4249	0.00546	3.32	0.714	124.2	0.74	2.60
3160691.	342404.	558521.	0.783	0.668	0.2878	22.450	0.3715	0.4262	0.00506	3.31	0.71			

TABLE IV. - Continued. UNIFORMLY

(e) Continued. Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	PB	Tb	ROB	VELOC	M	X2	T0	TW	H	H/HBK	H/HMW	H/HIF	TW/TB	THETA	RUFM
RUN 24- 851 WEIGHT FLOW, 0.1030 HEAT INPUT, 46.00 INLET BULK TEMP, 51.7 OUTLET BULK TEMP, 173.2 PLOT CH O															
2.50	721.0	65.7	3.57R	149.3	0.049	0.0643	979.	769.	0.00465	1.08	0.92	1.54	11.70	0.026	2.20
4.50	717.0	74.3	3.039	175.8	0.068	0.1502	993.	784.	0.00461	0.92	0.74	1.39	10.55	0.013	1.35
6.50	712.5	81.8	2.536	210.7	0.090	0.2667	910.	696.	0.00530	0.87	0.70	1.25	8.50	0.003	0.96
8.50	707.5	89.0	2.101	254.3	0.114	0.4033	840.	617.	0.00614	0.85	0.72	1.15	6.93	-0.011	0.76
9.50	704.5	92.8	1.915	279.0	0.126	0.4710	818.	592.	0.00648	0.84	0.74	1.11	6.38	-0.019	0.69
10.50	701.2	96.8	1.750	305.3	0.138	0.5359	756.	527.	0.00757	0.90	0.60	1.12	5.39	-0.032	0.67
11.50	697.8	101.0	1.604	333.1	0.149	0.5959	794.	565.	0.00696	0.81	0.77	1.02	5.59	-0.039	0.58
13.50	691.2	110.1	1.366	391.3	0.170	0.6955	724.	487.	0.00853	0.87	0.87	1.02	4.42	-0.073	0.55
15.50	683.9	119.8	1.184	451.2	0.191	0.7673	747.	512.	0.00621	0.79	0.84	0.92	4.27	-0.096	0.48
17.50	676.0	130.3	1.040	513.7	0.212	0.9811	740.	505.	0.00859	0.77	0.84	0.98	3.88	-0.129	0.39
19.50	668.0	141.3	0.924	578.4	0.232	0.9999	787.	557.	0.00776	0.69	0.77	0.78	3.94	-0.144	0.35
21.50	658.7	152.0	0.832	642.2	0.252	0.9999	720.	462.	0.00973	0.78	0.86	0.85	3.17	-0.214	0.38
RUN 28- 606 WEIGHT FLOW, 0.0839 HEAT INPUT, 35.05 INLET BULK TEMP, 50.0 OUTLET BULK TEMP, 159.3 PLOT CH S															
2.50	867.0	64.2	3.814	114.1	0.034	0.0343	623.	449.	0.00639	1.33	1.24	1.51	7.00	0.068	3.28
4.50	864.7	73.3	3.349	130.0	0.044	0.0987	717.	551.	0.00519	1.05	0.90	1.26	7.51	0.036	2.21
6.50	862.1	81.3	2.899	150.2	0.057	0.1903	785.	624.	0.00458	0.86	0.73	1.11	7.68	0.016	1.46
8.50	859.2	89.0	2.490	174.8	0.071	0.2930	771.	609.	0.00477	0.79	0.69	1.02	6.85	0.002	1.09
9.50	857.7	92.7	2.305	188.8	0.078	0.3583	693.	525.	0.00572	0.86	0.73	1.05	5.66	-0.006	1.06
10.50	856.1	96.5	2.136	203.7	0.085	0.4168	666.	496.	0.00618	0.86	0.76	1.03	5.13	-0.017	0.98
11.50	854.4	100.5	1.983	219.4	0.092	0.4732	671.	500.	0.00617	0.83	0.75	0.98	4.98	-0.027	0.88
13.50	850.8	108.8	1.720	253.0	0.105	0.5755	640.	467.	0.00687	0.62	0.79	0.95	4.30	-0.053	0.78
15.50	847.3	117.4	1.514	287.4	0.118	0.6545	632.	458.	0.00722	0.80	0.80	0.90	3.90	-0.082	0.71
17.50	843.5	126.7	1.347	323.1	0.130	0.9999	624.	449.	0.00762	0.78	0.81	0.87	3.55	-0.116	0.53
19.50	839.6	136.6	1.210	359.6	0.142	0.9999	642.	469.	0.00740	0.73	0.78	0.81	3.44	-0.142	0.50
21.50	835.5	146.6	1.098	396.2	0.153	0.9999	611.	436.	0.00850	0.77	0.83	0.84	2.97	-0.199	0.52
RUN 30- 608 WEIGHT FLOW, 0.1353 HEAT INPUT, 35.23 INLET BULK TEMP, 48.1 OUTLET BULK TEMP, 112.9 PLOT CH U															
2.50	816.1	57.7	4.057	173.0	0.048	0.0159	440.	230.	0.01430	1.70	1.52	1.78	3.99	0.177	3.92
4.50	812.6	64.1	3.763	186.5	0.057	0.0423	442.	232.	0.01464	1.68	1.32	1.77	3.62	0.142	3.47
6.50	808.6	69.8	3.463	202.7	0.068	0.0811	509.	304.	0.01056	1.36	0.95	1.41	4.36	0.077	2.83
8.50	804.3	74.9	3.163	221.9	0.080	0.1322	582.	383.	0.00807	0.99	0.73	1.12	5.11	0.041	2.18
9.50	802.0	77.5	3.017	232.7	0.087	0.1616	527.	324.	0.01006	1.14	0.79	1.26	4.19	0.041	2.13
10.50	799.6	79.6	2.873	244.3	0.095	0.1931	553.	351.	0.00914	1.02	0.72	1.14	4.41	0.029	1.88
11.50	797.1	81.9	2.734	256.7	0.102	0.2264	562.	362.	0.00888	0.96	0.69	1.09	4.42	0.019	1.70
13.50	791.9	86.4	2.468	284.3	0.119	0.2932	587.	388.	0.00826	0.85	0.63	0.97	4.49	0.002	1.38
15.50	786.7	90.8	2.225	315.5	0.135	0.3773	585.	387.	0.00841	0.81	0.62	0.92	4.26	-0.013	1.18
17.50	781.2	95.4	2.007	349.7	0.152	0.4546	572.	372.	0.00900	0.80	0.64	0.90	3.90	-0.032	1.05
19.50	775.2	100.2	1.814	386.8	0.168	0.5285	582.	383.	0.00880	0.74	0.63	0.83	3.82	-0.049	0.91
21.50	768.6	105.2	1.645	426.6	0.183	0.5965	541.	339.	0.01062	0.81	0.71	0.89	3.22	-0.082	0.89
RUN 32- 901 WEIGHT FLOW, 0.1935 HEAT INPUT, 37.10 INLET BULK TEMP, 48.2 OUTLET BULK TEMP, 66.0 PLOT CH W															
2.50	710.5	55.0	4.095	245.2	0.069	0.0168	478.	269.	0.01202	1.33	1.09	1.41	4.89	0.133	3.88
4.50	706.9	59.8	3.871	259.4	0.078	0.0335	578.	356.	0.00873	1.02	0.81	1.14	5.96	0.079	3.37
6.50	701.9	64.2	3.638	275.9	0.090	0.0567	664.	451.	0.00674	0.80	0.62	0.94	7.02	0.049	2.76
8.50	696.3	68.1	3.401	295.2	0.104	0.0872	714.	507.	0.00596	0.69	0.52	0.86	7.44	0.034	2.23
9.50	693.2	70.0	3.281	303.0	0.111	0.1052	692.	482.	0.00634	0.70	0.52	0.86	6.89	0.031	2.09
10.50	689.8	71.7	3.161	317.6	0.119	0.1250	649.	435.	0.00717	0.75	0.53	0.90	6.07	0.030	2.00
11.50	686.1	73.3	3.042	330.1	0.128	0.1464	654.	440.	0.00710	0.73	0.50	0.88	6.00	0.025	1.83
13.50	678.8	76.5	2.808	357.6	0.147	0.1935	602.	383.	0.00847	0.80	0.52	0.93	5.01	0.018	1.67
15.50	670.3	79.4	2.580	389.1	0.169	0.2465	601.	382.	0.00857	0.76	0.50	0.89	4.81	0.008	1.44
17.50	661.5	82.2	2.362	425.1	0.192	0.3057	604.	385.	0.00857	0.72	0.48	0.85	4.68	-0.003	1.23
19.50	652.1	85.0	2.157	465.5	0.216	0.3680	588.	368.	0.00916	0.72	0.49	0.84	4.33	-0.014	1.10
21.50	640.7	87.7	1.965	511.0	0.240	0.4314	572.	350.	0.00986	0.73	0.51	0.83	3.99	-0.028	1.00
RUN 42- 582 WEIGHT FLOW, 0.1468 HEAT INPUT, 17.36 INLET BULK TEMP, 45.9 OUTLET BULK TEMP, 78.0 PLOT CH Y															
2.50	686.7	50.4	4.269	178.4	0.048	0.0068	209.	89.	0.03154	1.60	2.20	1.63	1.77	0.830	4.28
4.50	686.1	53.8	4.129	184.4	0.052	0.0150	186.	55.	0.04360	41.19	36.32	42.20	1.03	17.475	4.17
6.50	683.4	56.9	3.988	191.0	0.056	0.0244	230.	115.	0.02113	1.20	1.41	1.22	2.02	0.438	3.98
8.50	680.7	59.9	3.845	198.1	0.061	0.0357	265.	154.	0.01306	1.12	0.94	1.16	2.57	0.237	3.72
9.50	679.2	61.3	3.772	201.9	0.063	0.0423	215.	97.	0.03424	1.64	1.83	1.67	1.58	0.584	3.83
10.50	677.8	62.6	3.700	205.8	0.066	0.0495	219.	102.	0.03108	1.54	1.64	1.56	1.63	0.494	3.75
11.50	676.3	63.9	3.626	210.0	0.069	0.0574	226.	109.	0.02682	1.44	1.42	1.47	1.71	0.397	3.65
13.50	673.3	66.3	3.478	218.9	0.075	0.0753	228.	112.	0.02674	1.48	1.33	1.51	1.69	0.339	3.50
15.50	670.0	68.6	3.329	228.7	0.083	0.0960	241.	127.	0.02107	1.37	1.03	1.41	1.85	0.225	3.26
17.50	666.7	70.7	3.180	239.5	0.090	0.1195	244.	130.	0.02059	1.36	0.98	1.42	1.84	0.182	3.08
19.50	663.4	72.8	3.031	251.2	0.099	0.1456	266.	154.	0.01510	1.20	0.75	1.25	2.12	0.106	2.77
21.50	659.6	74.7	2.884	264.0	0.108	0.1740	247.	133.	0.02107	1.40	0.92	1.45	1.78	0.112	2.76
RUN 44- 871 WEIGHT FLOW, 0.0740 HEAT INPUT, 46.62 INLET BULK TEMP, 81.3 OUTLET BULK TEMP, 251.9 PLOT CH Z															
2.50	745.0	94.8	1.939	198.0	0.087	0.4726	1032.	819.	0.00458	0.86	0.81	1.29	8.63	-0.014	0.56
4.50	740.7	107.2	1.534	250.3	0.108	0.6371	1064.	851.	0.00447	0.75	0.80	1.09	7.93	-0.030	0.41
6.50	735.4	120.9	1.258	305.2	0.128	0.7468	965.	749.	0.00525	0.78	0.85	1.01	6.20	-0.058	0.39
8.50	730.3	136.0	1.061	361.9	0.146	0.9999	915.	699.	0.00589	0.78	0.87	0.95	5.11	-0.092	0.32
9.50	727.3	143.9	0.982	390.9	0.154	0.9999	899.	677.	0.00616	0.78	0.87	0.92	4.70	-0.112	0.32
10.50	724.3	151.3	0.919	417.9	0.163	0.9999	836.	607.	0.00718	0.83	0.92	0.95	4.01	-0.148	0.35
11.50	721.3	158.8	0.863	445.0	0.171	0.9999	877.	652.	0.00665	0.78	0.86	0.89	4.11	-0.152	0.32
13.50	714.9	174.1	0.768	499.7	0.187	0.9999	813.	580.	0.00804	0.64	0.91	0.92	3.33	-0.223	0.34
15.50	708.1	188.7	0.695	552.4	0.201	0.9999	823.	592.	0.00810	0.62	0.86	0.89	3.14	-0.261	0.33
17.50	701.0	202.9	0.636	604.0	0.215	0.9999	820.	589.	0.00847	0.62	0.84	0.89	2.90	-0.311	0.32
19.50	694.0	217.0	0.585	655.7	0.227	0.9999	817.	586.	0.00886	0.63	0.83	0.89	2.70	-0.364	0.31
21.50	686.1	230.4	0.543	706.3	0.239	0.9999	750.	509.	0.01165	0.96	0.96	1.03	2.21	-0.530	0.34

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-H	PHI-F	FFLUX	U/DL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.06 TEST VOLTAGE, 47.2 HEAT INPUT/UNIT AREA, 3.220 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1592292.	144014.	1013630.	1.156	0.664	3.2579	29.641	0.3205	0.4147	0.00004	3.27	0.744	102.1	0.40	2.28
2158337.	160646.	714016.	1.098	0.693	1.4013	35.422	0.3746	0.4105	0.00702	3.27	0.690	107.6	0.48	2.48
2713319.	227181.	861618.	1.018	0.667	0.7915	30.647	0.4051	0.4238	0.00621	3.25	0.680	119.8	0.58	2.54
3125141.	319285.	668098.	0.907	0.667	0.4920	24.096	0.4063	0.4268	0.00544	3.24	0.693	132.7	0.68	2.50
3258881.	366525.	675687.	0.851	0.667	0.3968	21.493	0.4007	0.4261	0.00510	3.23	0.695	138.3	0.71	2.48
3349207.	471914.	774998.	0.795	0.665	0.3390	16.441	0.3929	0.4245	0.00492	3.22	0.734	150.4	0.79	2.37
3402122.	454580.	690443.	0.742	0.667	0.2669	17.532	0.3839	0.4254	0.00446	3.23	0.688	147.7	0.76	2.47
3421609.	632987.	837836.	0.664	0.665	0.2026	11.845	0.3680	0.4238	0.00408	3.21	0.731	166.1	0.84	2.35
3371254.	658862.	805424.	0.622	0.667	0.1514	11.111	0.3600	0.4241	0.00356	3.22	0.684	169.0	0.81	2.43
3284018.	735336.	745751.	0.602	0.667	0.0138	9.403	0.3547	0.4239	0.00319	3.22	0.669	177.4	0.87	2.49
3178505.	760380.	700439.	0.594	0.669	0.0002	9.636	0.3515	0.4253	0.00279	3.23	0.602	175.9	0.78	2.63
3074733.	900055.	900120.	0.557	0.668	0.0002	6.691	0.3537	0.4232	0.00267	3.21	0.663	196.1	0.85	2.49
HEAT BALANCE, -0.00 TEST VOLTAGE, 40.9 HEAT INPUT/UNIT AREA, 2.467 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1112045.	289860.	1563287.	1.149	0.649	8.4224	9.226	0.2926	0.4246	0.00752	2.46	0.854	112.1	0.46	1.96
1465662.	239631.	1065364.	1.088	0.658	2.7961	15.015	0.3404	0.4305	0.00651	2.48	0.719	108.2	0.46	2.14
1846422.	225998.	754600.	0.994	0.661	1.3473	20.234	0.3737	0.4315	0.00563	2.49	0.641	107.0	0.49	2.37
2179074.	266825.	661309.	0.918	0.661	0.8168	19.765	0.3908	0.4313	0.00500	2.48	0.620	113.3	0.55	2.44
2310501.	351571.	745282.	0.878	0.658	0.6990	15.159	0.3926	0.4302	0.00496	2.47	0.659	124.6	0.63	2.33
2413615.	405285.	764816.	0.835	0.657	0.5840	13.379	0.3901	0.4301	0.00468	2.47	0.671	130.9	0.67	2.30
2489771.	425504.	734406.	0.794	0.657	0.4817	13.045	0.3864	0.4300	0.00438	2.47	0.657	132.8	0.68	2.34
2573746.	523472.	774134.	0.722	0.656	0.3584	10.484	0.3763	0.4299	0.00396	2.46	0.668	143.0	0.73	2.32
2589222.	592994.	792323.	0.670	0.656	0.2822	9.028	0.3700	0.4298	0.00357	2.46	0.660	150.1	0.75	2.33
2563141.	663189.	663243.	0.635	0.656	0.0002	7.730	0.3655	0.4297	0.00323	2.46	0.655	157.4	0.87	2.45
2512389.	677287.	677340.	0.614	0.658	0.0002	7.348	0.3527	0.4295	0.00289	2.46	0.619	159.9	0.81	2.51
2449940.	792221.	792274.	0.604	0.657	0.0002	5.781	0.3625	0.4293	0.00270	2.46	0.650	171.9	0.84	2.46
HEAT BALANCE, 0.00 TEST VOLTAGE, 40.7 HEAT INPUT/UNIT AREA, 2.483 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1536165.	1084683.	3866687.	1.185	0.603	23.4894	2.971	0.2666	0.3605	0.00562	2.46	0.901	217.6	0.53	1.89
1857028.	1106659.	3644768.	1.151	0.602	9.3900	3.404	0.2986	0.3621	0.00549	2.46	0.858	228.2	0.59	1.83
2224871.	813770.	2888577.	1.121	0.617	4.4017	5.806	0.3308	0.3828	0.00516	2.48	0.705	208.2	0.51	1.83
2629878.	636363.	2179109.	1.078	0.641	2.4174	9.156	0.3592	0.4090	0.00462	2.49	0.599	192.3	0.46	1.94
2836691.	827071.	2405365.	1.049	0.625	2.1290	7.186	0.3704	0.3920	0.00467	2.48	0.656	212.4	0.56	1.84
3039873.	769149.	2141337.	1.018	0.635	1.6966	8.406	0.3794	0.4026	0.00445	2.48	0.619	206.9	0.53	1.90
3235450.	768192.	1998141.	0.991	0.638	1.3962	8.961	0.3868	0.4055	0.00426	2.48	0.602	206.8	0.54	1.93
3591716.	758394.	1726609.	0.951	0.645	0.9707	10.127	0.3979	0.4122	0.00386	2.49	0.568	205.1	0.54	2.01
3881790.	862759.	1631156.	0.893	0.646	0.7177	9.875	0.3989	0.4127	0.00358	2.49	0.563	210.6	0.57	2.03
4093924.	944950.	1635884.	0.834	0.644	0.5567	8.870	0.3944	0.4100	0.00335	2.49	0.572	220.1	0.61	2.01
4234838.	982751.	1540808.	0.779	0.647	0.4280	8.770	0.3876	0.4135	0.00306	2.49	0.555	222.3	0.61	2.07
4315282.	1234929.	1749552.	0.727	0.639	0.3603	6.692	0.3789	0.4041	0.00297	2.48	0.609	242.1	0.70	1.97
HEAT BALANCE, 0.69 TEST VOLTAGE, 40.0 HEAT INPUT/UNIT AREA, 2.603 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2151244.	1122890.	5251372.	1.136	0.602	19.2663	4.296	0.2622	0.3623	0.00463	2.57	0.642	261.6	0.35	1.89
2496119.	776317.	4193250.	1.174	0.635	8.7691	7.498	0.2871	0.3922	0.00439	2.59	0.541	237.1	0.30	1.89
2888294.	576730.	3224332.	1.164	0.657	4.7503	12.301	0.3140	0.4177	0.00402	2.61	0.466	218.4	0.27	1.97
3031665.	511160.	2604653.	1.153	0.664	2.9576	16.232	0.3411	0.4237	0.00375	2.62	0.428	212.1	0.27	2.07
3569876.	545444.	2586247.	1.144	0.662	2.5191	15.500	0.3540	0.4235	0.00371	2.61	0.433	220.4	0.29	2.06
3816006.	672117.	2710814.	1.133	0.657	2.2284	13.520	0.3661	0.4149	0.00372	2.60	0.450	234.9	0.32	2.00
4067476.	680611.	2561301.	1.117	0.658	1.8813	14.201	0.3768	0.4164	0.00362	2.60	0.444	236.3	0.33	2.02
4569299.	877384.	2714734.	1.081	0.648	1.4919	11.637	0.3943	0.4028	0.00358	2.59	0.472	258.6	0.40	1.93
5055403.	937071.	2533932.	1.059	0.649	1.1307	11.932	0.4088	0.4028	0.00340	2.59	0.468	263.8	0.43	1.94
5502683.	971487.	2359201.	1.029	0.651	0.8633	12.189	0.4171	0.4036	0.00320	2.59	0.463	267.5	0.44	1.96
5887575.	1127994.	2359855.	0.971	0.648	0.6868	11.215	0.4163	0.3997	0.00306	2.59	0.474	278.1	0.48	1.93
6207305.	1288220.	2403738.	0.916	0.646	0.5542	10.107	0.4126	0.3954	0.00294	2.59	0.489	289.6	0.52	1.90
HEAT BALANCE, -0.04 TEST VOLTAGE, 28.1 HEAT INPUT/UNIT AREA, 1.221 ID, 0.188 OD, 0.250 LENGTH, 24.0														
1440046.	2078733.	2706806.	1.229	1.147	82.4620	0.931	0.2432	0.3537	0.00185	1.22	1.534	348.9	1.19	1.93
1595608.	1621010.	1652613.	1.203	1.197	42.9335	1.659	0.2585	0.2623	0.00158	1.22	35.339	456.9	41.27	1.91
1755975.	2410839.	4360476.	1.164	0.958	22.4211	1.287	0.2739	0.4122	0.00241	1.22	1.003	326.7	0.60	1.87
1927518.	1807039.	4758027.	1.176	0.681	12.8379	2.052	0.2903	0.3715	0.00281	1.23	0.634	289.5	0.41	1.83
2018444.	2614322.	3813465.	1.174	1.056	14.5830	1.190	0.2987	0.4050	0.00224	1.22	1.399	368.8	1.06	1.85
2112896.	2661567.	4146184.	1.172	1.025	12.1742	1.271	0.3073	0.4140	0.00235	1.22	1.272	363.6	0.92	1.83
2211201.	2624855.	4490974.	1.170	0.942	10.0722	1.404	0.3160	0.4118	0.00248	1.22	1.107	354.4	0.78	1.81
2418784.	2649103.	4650012.	1.165	0.898	7.5678	1.519	0.3332	0.4082	0.00256	1.22	1.071	356.9	0.78	1.78
2640227.	2411478.	4799457.	1.159	0.770	5.4673	1.865	0.3501	0.3898	0.00269	1.22	0.858	341.3	0.65	1.73
2872350.	2397473.	4789122.	1.148	0.734	4.2859	2.020	0.3658	0.3831	0.00271	1.22	0.824	341.9	0.67	1.70
3111075.	2023423.	4485311.	1.131	0.639	3.1599	2.676	0.3796	0.3630	0.00275	1.23	0.623	318.9	0.56	1.66
3352438.	2480301.	4752431.	1.109	0.698	2.8219	2.218	0.3913	0.3757	0.00269	1.22	0.814	347.9	0.73	1.64
HEAT BALANCE, -0.03 TEST VOLTAGE, 47.0 HEAT INPUT/UNIT AREA, 3.272 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2296772.	169088.	316662.	0.834	0.692	0.3483	34.663	0.3964	0.4086	0.00641	3.32	0.784	91.3	0.82	2.77
2401340.	196754.	288267.	0.790	0.689	0.1991	30.720	0.3744	0.4082	0.00521	3.32	0.718	95.2	0.83	2.88
2371664.	278959.	352959.	0.630	0.694	0.1458	20.282	0.3627	0.4095	0.00446	3.30	0.717	107.7	0.86	2.76
2284693.	356334.	356367.	0.602	0.682	0.0001	14.626	0.3569	0.4156	0.00391	3.29	0.698	118.6	0.95	2.81
2232813.	371439.	391473.	0.596	0.678	0.0001	12.730	0.3554	0.4174	0.00367	3.29	0.689	123.6	0.92	2.81

TABLE IV. - Continued. UNIFORMLY

(e) Continued. Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HIK	H/HIM	H/HF	LW/TB	THETA	ROFM
RUN 45- 865 WEIGHT FLOW, 0.0830 HEAT INPUT, 45.92 INLET BULK TEMP, 67.2 OUTLET BULK TEMP, 214.9 PLOT CH 3															
2.50	432.7	75.0	1.945	221.3	0.122	0.3422	1100.	885.	0.00403	0.78	0.65	1.66	11.81	-0.005	0.44
4.50	424.6	82.1	1.414	304.6	0.166	0.5410	955.	738.	0.00493	0.82	0.77	1.39	8.99	-0.017	0.33
6.50	415.5	91.9	1.067	403.4	0.207	0.7014	859.	632.	0.00595	0.86	0.90	1.21	6.88	-0.040	0.29
8.50	404.8	104.0	0.837	514.2	0.246	0.8117	841.	611.	0.00633	0.82	0.97	1.08	5.88	-0.067	0.25
9.50	398.8	110.7	0.751	572.9	0.266	0.8505	835.	604.	0.00650	0.81	0.98	1.03	5.46	-0.083	0.24
10.50	392.4	117.4	0.680	632.8	0.287	0.8805	789.	553.	0.00735	0.86	1.04	1.04	4.71	-0.110	0.24
11.50	385.6	124.4	0.619	695.4	0.307	0.9043	839.	608.	0.00664	0.77	0.97	0.96	4.89	-0.114	0.21
13.50	371.5	138.9	0.520	827.9	0.349	0.9378	770.	531.	0.00814	0.85	1.05	0.97	3.82	-0.180	0.21
15.50	356.0	153.1	0.445	967.6	0.394	0.9999	805.	570.	0.00767	0.78	0.97	0.88	3.73	-0.204	0.18
17.50	344.0	167.0	0.390	1103.9	0.437	0.9999	808.	574.	0.00788	0.76	0.92	0.85	3.43	-0.245	0.17
19.50	319.4	180.8	0.332	1296.2	0.499	0.9999	823.	590.	0.00783	0.74	0.87	0.82	3.27	-0.280	0.15
21.50	294.9	193.6	0.285	1509.3	0.568	0.9999	873.	648.	0.00709	0.69	0.78	0.76	3.35	-0.283	0.13
RUN 46- 870 WEIGHT FLOW, 0.1140 HEAT INPUT, 46.55 INLET BULK TEMP, 78.1 OUTLET BULK TEMP, 192.5 PLOT CH 4															
2.50	712.6	86.3	2.264	261.2	0.116	0.3492	761.	515.	0.00758	0.97	0.75	1.22	5.97	-0.006	0.97
4.50	705.9	93.1	1.909	303.8	0.140	0.4739	844.	609.	0.00634	0.76	0.69	1.01	6.54	-0.019	0.67
6.50	698.0	100.5	1.619	365.2	0.163	0.5896	863.	630.	0.00619	0.69	0.67	0.90	6.27	-0.033	0.53
8.50	688.9	108.7	1.389	425.8	0.186	0.6850	832.	596.	0.00671	0.68	0.70	0.85	5.48	-0.054	0.48
9.50	684.1	113.0	1.295	456.7	0.197	0.7230	815.	576.	0.00705	0.69	0.72	0.84	5.10	-0.066	0.47
10.50	679.1	117.5	1.211	480.3	0.209	0.7559	760.	513.	0.00821	0.74	0.79	0.87	4.37	-0.089	0.48
11.50	674.0	122.1	1.136	520.6	0.220	0.7841	788.	545.	0.00770	0.69	0.75	0.81	4.47	-0.095	0.44
13.50	663.2	131.7	1.006	588.1	0.243	0.9843	722.	471.	0.00957	0.77	0.83	0.86	3.57	-0.148	0.40
15.50	652.4	141.7	0.899	657.9	0.265	0.9999	725.	474.	0.00977	0.75	0.82	0.83	3.34	-0.183	0.38
17.50	640.4	151.4	0.813	727.6	0.287	0.9999	718.	466.	0.01029	0.75	0.83	0.82	3.08	-0.225	0.38
19.50	626.8	161.1	0.739	800.3	0.310	0.9999	727.	477.	0.01027	0.73	0.80	0.79	2.96	-0.257	0.36
21.50	612.0	170.9	0.674	877.4	0.334	0.9999	716.	464.	0.01105	0.75	0.81	0.80	2.72	-0.313	0.35
RUN 49- 592 WEIGHT FLOW, 0.0705 HEAT INPUT, 24.35 INLET BULK TEMP, 76.6 OUTLET BULK TEMP, 166.7 PLOT CH 7															
2.50	605.5	83.0	2.117	172.7	0.083	0.3653	491.	348.	0.00642	1.16	0.74	1.35	4.20	-0.016	1.10
4.50	602.2	88.3	1.808	202.3	0.098	0.4760	527.	385.	0.00575	0.96	0.70	1.13	4.36	-0.032	0.83
6.50	598.8	94.3	1.555	235.2	0.112	0.5795	574.	435.	0.00503	0.76	0.66	0.73	4.62	-0.046	0.64
8.50	595.1	101.0	1.351	270.8	0.125	0.6680	607.	470.	0.00466	0.68	0.64	0.81	4.65	-0.061	0.53
9.50	593.2	104.6	1.264	289.3	0.132	0.7057	543.	402.	0.00575	0.78	0.73	0.89	3.84	-0.089	0.56
10.50	591.3	108.4	1.187	308.0	0.138	0.7390	537.	396.	0.00594	0.77	0.75	0.87	3.66	-0.105	0.54
11.50	589.4	112.2	1.120	326.5	0.145	0.7675	539.	393.	0.00598	0.75	0.75	0.85	3.55	-0.119	0.52
13.50	585.3	120.2	1.004	364.2	0.158	0.8147	524.	382.	0.00652	0.77	0.78	0.84	3.18	-0.161	0.50
15.50	581.2	128.5	0.908	402.7	0.170	0.8506	516.	374.	0.00694	0.77	0.80	0.83	2.91	-0.206	0.47
17.50	577.2	137.2	0.828	441.8	0.182	0.9889	508.	366.	0.00746	0.76	0.83	0.84	2.67	-0.261	0.42
19.50	572.9	146.0	0.760	481.0	0.194	0.9999	526.	384.	0.00717	0.72	0.79	0.78	2.63	-0.288	0.39
21.50	568.6	154.4	0.706	518.3	0.205	0.9999	505.	363.	0.00819	0.78	0.84	0.83	2.35	-0.371	0.40
RUN 53- 521 WEIGHT FLOW, 0.0990 HEAT INPUT, 25.20 INLET BULK TEMP, 69.8 OUTLET BULK TEMP, 126.4 PLOT CH A															
2.50	479.0	73.6	2.346	218.9	0.111	0.2501	462.	314.	0.00735	1.27	0.60	1.50	4.27	-0.002	1.31
4.50	475.1	76.6	2.037	252.1	0.133	0.3355	470.	322.	0.00721	1.13	0.59	1.34	4.21	-0.014	1.04
6.50	470.8	79.7	1.768	290.5	0.155	0.4253	523.	378.	0.00595	0.86	0.54	1.06	4.75	-0.023	0.77
8.50	465.6	83.3	1.538	333.9	0.177	0.5144	572.	430.	0.00514	0.69	0.51	0.87	5.17	-0.031	0.59
9.50	463.0	85.2	1.438	357.2	0.188	0.5565	506.	360.	0.00646	0.82	0.59	0.98	4.23	-0.046	0.63
10.50	460.2	87.3	1.347	381.4	0.198	0.5962	503.	355.	0.00658	0.81	0.61	0.95	4.09	-0.055	0.59
11.50	457.3	89.5	1.264	406.5	0.209	0.6334	500.	357.	0.00649	0.79	0.62	0.92	3.96	-0.065	0.56
13.50	451.4	94.4	1.119	459.0	0.230	0.6997	488.	347.	0.00717	0.79	0.66	0.90	3.62	-0.090	0.52
15.50	445.2	99.7	0.998	514.7	0.250	0.7557	484.	337.	0.00746	0.77	0.69	0.86	3.38	-0.118	0.48
17.50	438.6	105.5	0.895	573.5	0.270	0.8021	476.	332.	0.00783	0.76	0.73	0.84	3.14	-0.151	0.44
19.50	431.4	111.5	0.810	634.3	0.292	0.8393	501.	355.	0.00728	0.68	0.70	0.76	3.19	-0.165	0.39
21.50	421.7	117.5	0.733	700.2	0.316	0.8697	479.	332.	0.00826	0.73	0.76	0.79	2.82	-0.218	0.39
RUN 55- 614 WEIGHT FLOW, 0.1073 HEAT INPUT, 25.34 INLET BULK TEMP, 83.9 OUTLET BULK TEMP, 143.8 PLOT CH C															
2.50	808.9	89.0	2.370	234.9	0.099	0.3321	379.	225.	0.01310	1.30	0.88	1.38	2.53	-0.009	1.76
4.50	805.2	93.1	2.163	257.3	0.110	0.4016	348.	192.	0.01801	1.56	1.08	1.63	2.06	-0.055	1.72
6.50	801.2	97.4	1.977	281.5	0.121	0.4633	394.	241.	0.01238	1.13	0.83	1.20	2.48	-0.069	1.37
8.50	796.6	101.8	1.810	307.6	0.132	0.5342	440.	290.	0.00951	0.88	0.70	0.94	2.85	-0.077	1.11
9.50	794.2	104.1	1.733	321.2	0.137	0.5648	398.	245.	0.01264	1.08	0.85	1.14	2.35	-0.120	1.18
10.50	791.8	106.5	1.661	335.1	0.142	0.5938	410.	258.	0.01175	0.99	0.81	1.05	2.43	-0.128	1.09
11.50	789.3	108.9	1.594	349.1	0.148	0.6208	397.	244.	0.01321	1.07	0.88	1.13	2.24	-0.162	1.09
13.50	784.1	113.7	1.475	377.5	0.158	0.6683	412.	260.	0.01222	0.96	0.83	1.02	2.28	-0.195	0.98
15.50	778.7	118.8	1.369	406.7	0.169	0.7087	411.	259.	0.01275	0.96	0.85	1.01	2.18	-0.231	0.92
17.50	773.0	124.1	1.274	436.8	0.180	0.7422	423.	272.	0.01208	0.89	0.82	0.94	2.19	-0.256	0.84
19.50	767.3	129.5	1.190	467.7	0.190	0.9987	443.	293.	0.01095	0.79	0.76	0.83	2.26	-0.266	0.66
21.50	761.4	135.2	1.115	499.4	0.200	0.9939	425.	274.	0.01286	0.80	0.84	0.92	2.03	-0.356	0.68
RUN 57- 523 WEIGHT FLOW, 0.1310 HEAT INPUT, 25.20 INLET BULK TEMP, 66.5 OUTLET BULK TEMP, 92.3 PLOT CH E															
2.50	365.4	70.6	2.128	319.4	0.181	0.2639	426.	274.	0.00667	1.26	0.49	1.51	3.89	-0.007	1.19
4.50	378.1	72.2	1.869	367.6	0.212	0.3337	415.	262.	0.00928	1.26	0.51	1.46	3.63	-0.018	1.03
6.50	369.6	73.8	1.635	415.6	0.245	0.4084	473.	324.	0.00708	0.70	0.45	1.10	4.39	-0.022	0.74
8.50	360.2	75.7	1.429	475.6	0.279	0.4843	523.	375.	0.00593	0.70	0.43	0.87	4.96	-0.026	0.56
9.50	355.2	76.8	1.336	506.5	0.297	0.5213	463.	313.	0.00750	0.86	0.50	1.02	4.07	-0.038	0.60
10.50	350.0	77.9	1.251	543.4	0.315	0.5571	466.	316.	0.00743	0.82	0.51	0.98	4.06	-0.044	0.55
11.50	344.6	79.2	1.171	580.5	0.334	0.5918	466.	316.	0.00747	0.80	0.53	0.94	3.99	-0.050	0.51
13.50	333.3	82.0	1.028	661.1	0.373	0.6564	450.	299.	0.00813	0.80	0.62	0.91	3.47	-0.090	0.42
15.50	321.4	85.1	0.905	751.1	0.414	0.7141	446.	295.	0.00841	0.80	0.62	0.91	3.26	-0.115	0.39
17.50	308.9	88.7	0.798	851.7	0.457	0.7646	440.	287.	0.00882	0.79	0.65	0.89	3.46	-0.124	0.33
19.50	294.0	92.5	0.701	969.3	0.507	0.8036	464.	314.	0.00798	0.69	0.64	0.78	3.46	-0.154	0.33
21.50	272.2	96.3	0.603	1126.8	0.576	0.8484	439.	288.	0.00922	0.76	0.72	0.84	2.99	-0.164	0.31

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.03 TEST VOLTAGE, 46.5 HEAT INPUT/UNIT AREA, 3.198 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2910879.	103024.	274550.	1.245	0.691	0.3934	76.919	0.4721	0.4053	0.00916	3.27	0.794	85.5	0.79	2.84
3270249.	183001.	321174.	0.874	0.685	0.2097	47.190	0.4203	0.4118	0.00721	3.24	0.815	98.1	0.90	2.68
3321810.	294355.	405979.	0.676	0.679	0.1253	28.553	0.3725	0.4184	0.00591	3.21	0.830	112.1	0.95	2.56
3214350.	373165.	449951.	0.604	0.679	0.0776	21.053	0.3401	0.4180	0.00489	3.21	0.794	121.2	0.94	2.55
3134551.	410281.	473778.	0.592	0.679	0.0630	18.344	0.3299	0.4178	0.00450	3.21	0.775	125.8	0.92	2.55
3049955.	497234.	555410.	0.590	0.680	0.0543	14.148	0.3243	0.4152	0.00428	3.20	0.800	135.5	0.96	2.44
2962590.	463308.	505483.	0.593	0.679	0.0437	14.917	0.3204	0.4172	0.00386	3.21	0.728	133.0	0.88	2.58
2789342.	617123.	649931.	0.604	0.681	0.0350	9.780	0.3166	0.4146	0.00351	3.19	0.765	150.3	0.93	2.44
2637194.	607256.	609313.	0.622	0.681	0.0201	9.293	0.3207	0.4168	0.00308	3.20	0.697	152.3	0.88	2.57
2500356.	646641.	546691.	0.638	0.680	0.0002	8.067	0.3295	0.4158	0.00280	3.20	0.673	158.6	0.85	2.60
2384506.	660433.	666477.	0.653	0.679	0.0002	7.403	0.3380	0.4142	0.00257	3.21	0.641	162.7	0.82	2.64
2287394.	605663.	605705.	0.664	0.692	0.0002	7.709	0.3480	0.4072	0.00236	3.22	0.586	160.7	0.76	2.74
HEAT BALANCE, -0.06 TEST VOLTAGE, 46.5 HEAT INPUT/UNIT AREA, 3.253 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3300728.	428927.	970242.	0.955	0.664	0.6566	18.254	0.4088	0.4247	0.00555	3.25	0.721	155.0	0.68	2.28
3609291.	391491.	720289.	0.848	0.667	0.3881	22.424	0.4003	0.4266	0.00460	3.27	0.637	148.1	0.66	2.52
3761237.	427862.	661337.	0.748	0.668	0.2585	21.213	0.3849	0.4262	0.00398	3.28	0.603	151.3	0.66	2.60
3796071.	522999.	710311.	0.671	0.668	0.1906	16.952	0.3692	0.4261	0.00356	3.27	0.601	161.8	0.69	2.57
3783926.	577593.	748016.	0.646	0.668	0.1684	15.012	0.3648	0.4255	0.00339	3.27	0.603	167.8	0.70	2.54
3758581.	709547.	879569.	0.628	0.667	0.1567	11.592	0.3611	0.4239	0.00333	3.25	0.641	181.2	0.75	2.42
3723096.	685423.	825864.	0.615	0.668	0.1363	11.984	0.3580	0.4246	0.00310	3.26	0.605	179.3	0.72	2.50
3632623.	902663.	912999.	0.599	0.667	0.0121	8.239	0.3533	0.4227	0.00294	3.24	0.658	200.4	0.85	2.42
3526574.	959524.	959601.	0.593	0.668	0.0002	7.351	0.3502	0.4225	0.00267	3.24	0.639	207.2	0.83	2.45
3423044.	1036710.	1036786.	0.596	0.668	0.0002	6.402	0.3520	0.4221	0.00247	3.24	0.638	215.9	0.82	2.45
3322357.	1060213.	1060283.	0.603	0.670	0.0002	5.988	0.3555	0.4221	0.00228	3.25	0.618	220.2	0.79	2.48
3224370.	1145287.	1145362.	0.612	0.670	0.0002	5.190	0.3596	0.4215	0.00215	3.24	0.628	229.9	0.80	2.47
HEAT BALANCE, -0.01 TEST VOLTAGE, 33.9 HEAT INPUT/UNIT AREA, 1.710 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2201826.	424400.	899848.	1.004	0.647	0.6846	11.107	0.4241	0.3915	0.00595	1.70	0.740	125.9	0.76	1.86
2371156.	423259.	754945.	0.890	0.656	0.4387	12.122	0.4123	0.4019	0.00505	1.71	0.683	123.5	0.73	1.98
2457801.	406958.	631193.	0.778	0.666	0.2903	13.533	0.3939	0.4162	0.00426	1.71	0.617	120.1	0.67	2.16
2480795.	410942.	570580.	0.693	0.669	0.2049	13.570	0.3760	0.4193	0.00368	1.72	0.571	119.6	0.64	2.27
2474903.	533572.	701254.	0.663	0.663	0.1916	9.664	0.3682	0.4100	0.00368	1.71	0.634	131.6	0.73	2.10
2460589.	570218.	720780.	0.639	0.663	0.1694	8.811	0.3614	0.4093	0.00350	1.71	0.635	134.9	0.74	2.10
2440635.	591442.	724570.	0.623	0.664	0.1506	8.345	0.3574	0.4107	0.00332	1.71	0.627	136.9	0.73	2.12
2388178.	672688.	782236.	0.603	0.663	0.1249	6.885	0.3512	0.4085	0.00306	1.71	0.639	144.6	0.76	2.09
2325354.	737740.	826051.	0.594	0.663	0.1066	5.899	0.3469	0.4084	0.00282	1.71	0.643	151.1	0.77	2.09
2257581.	804198.	810147.	0.591	0.663	0.0098	5.056	0.3441	0.4082	0.00260	1.71	0.652	158.0	0.83	2.13
2190016.	797005.	797063.	0.594	0.668	0.0002	4.919	0.3434	0.4151	0.00236	1.71	0.615	159.0	0.78	2.22
2127569.	889347.	889403.	0.600	0.666	0.0002	4.060	0.3469	0.4114	0.00225	1.71	0.656	168.3	0.83	2.17
HEAT BALANCE, -0.01 TEST VOLTAGE, 34.6 HEAT INPUT/UNIT AREA, 1.775 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2976469.	520070.	1476648.	1.313	0.643	1.0324	12.543	0.4626	0.3647	0.00606	1.77	0.657	163.8	0.65	1.69
3318863.	566952.	1332220.	1.179	0.647	0.7034	12.761	0.4577	0.3689	0.00543	1.77	0.649	165.0	0.68	1.71
3570106.	512489.	1036301.	1.048	0.664	0.4627	15.686	0.4447	0.3896	0.00462	1.78	0.582	155.4	0.61	1.89
3734925.	481408.	847389.	0.902	0.673	0.3164	18.230	0.4228	0.4050	0.00395	1.78	0.530	148.9	0.57	2.06
3787040.	651215.	1059827.	0.838	0.662	0.2969	12.661	0.4113	0.3855	0.00402	1.78	0.597	164.6	0.67	1.85
3821854.	693686.	1066956.	0.784	0.662	0.2585	11.874	0.4005	0.3851	0.00384	1.77	0.598	167.3	0.68	1.85
3841815.	735477.	1075839.	0.740	0.662	0.2262	11.143	0.3905	0.3848	0.00366	1.77	0.599	170.0	0.69	1.85
3844266.	847095.	1138382.	0.675	0.661	0.1780	9.393	0.3726	0.3821	0.00338	1.77	0.612	177.9	0.71	1.82
3809242.	934101.	1176171.	0.633	0.662	0.1412	8.236	0.3574	0.3819	0.00310	1.77	0.613	184.0	0.72	1.82
3748749.	1025708.	1227248.	0.607	0.662	0.1141	7.179	0.3444	0.3815	0.00287	1.77	0.616	190.9	0.74	1.82
3674198.	999582.	1152682.	0.594	0.669	0.0906	7.253	0.3356	0.3895	0.00256	1.77	0.569	189.5	0.68	1.91
3595751.	1151737.	1286189.	0.590	0.666	0.0773	5.669	0.3298	0.3838	0.00245	1.77	0.606	201.4	0.73	1.85
HEAT BALANCE, -0.01 TEST VOLTAGE, 34.5 HEAT INPUT/UNIT AREA, 1.785 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2932250.	1262357.	2275928.	0.920	0.602	1.1171	4.068	0.3975	0.3658	0.00392	1.78	0.770	227.1	0.85	1.66
3111963.	1621484.	2541092.	0.845	0.603	0.9221	3.085	0.3957	0.3601	0.00385	1.78	0.666	251.5	1.12	1.59
3243727.	1322181.	2038999.	0.815	0.606	0.6552	4.238	0.3913	0.3717	0.00342	1.78	0.733	229.2	0.86	1.68
3333007.	1129509.	1671641.	0.769	0.623	0.4851	5.378	0.3851	0.3864	0.00302	1.79	0.611	213.9	0.71	1.82
3463248.	1423491.	1976895.	0.746	0.609	0.4719	3.979	0.3815	0.3742	0.00309	1.78	0.736	235.2	0.90	1.70
3384857.	1377770.	1871018.	0.724	0.614	0.4184	4.186	0.3777	0.3787	0.00295	1.78	0.695	231.7	0.85	1.74
3398817.	1514319.	1982234.	0.704	0.610	0.3917	3.689	0.3744	0.3749	0.00291	1.78	0.753	241.2	0.93	1.70
3407934.	1480067.	1862954.	0.672	0.617	0.3239	3.610	0.3700	0.3813	0.00268	1.78	0.703	238.8	0.87	1.76
3397463.	1557477.	1882734.	0.647	0.618	0.2817	3.525	0.3663	0.3824	0.00252	1.78	0.717	244.6	0.90	1.77
3372414.	1535934.	1805480.	0.629	0.625	0.2451	3.553	0.3633	0.3886	0.00233	1.79	0.679	243.8	0.85	1.83
3336483.	1468337.	1469448.	0.615	0.634	0.0016	3.728	0.3609	0.3978	0.00213	1.79	0.622	240.0	0.83	1.97
3293013.	1641302.	1641402.	0.606	0.630	0.0002	3.117	0.3590	0.3927	0.00206	1.79	0.690	253.5	0.92	1.92
HEAT BALANCE, 0.14 TEST VOLTAGE, 34.4 HEAT INPUT/UNIT AREA, 1.770 ID, 0.188 OD, 0.250 LENGTH, 24.0														
4412680.	761288.	2151809.	1.528	0.636	0.9286	12.533	0.5056	0.3383	0.00533	1.76	0.594	214.8	0.63	1.52
4820783.	897773.	2148951.	1.403	0.633	0.6973	11.377	0.4799	0.3337	0.00497	1.76	0.621	222.1	0.70	1.47
5152860.	744943.	1584502.	1.223	0.659	0.4677	15.455	0.4805	0.3594	0.00429	1.77	0.546	202.2	0.60	1.64
5405208.	670610.	1262298.	1.027	0.672	0.3272	18.606	0.4518	0.3801	0.00373	1.78	0.494	190.1	0.54	1.82
5502068.	909651.	1589950.	0.944	0.658	0.3115	13.233	0.4375	0.3544	0.00382	1.77	0.565	209.8	0.65	1.60
5580941.														

TABLE IV. - Continued. UNIFORMLY

(e) Continued. Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	PB	TB	ROH	VELOC	M	x2	TO	TW	H	H/HHK	H/HFW	H/HF	TW/TB	THETA	RUFM
RUN 58- 527 WEIGHT FLOW, 0.1438 HEAT INPUT, 24.90 INLET BULK TEMP, 66.1 OUTLET BULK TEMP, 96.0 PLOT CH F															
2.50	478.1	69.2	2.818	264.7	0.120	0.1495	398.	249.	0.00975	1.37	0.59	1.54	3.59	0.022	2.00
4.50	472.0	71.3	2.570	290.2	0.141	0.1955	396.	246.	0.01002	1.32	0.55	1.49	3.45	0.009	1.74
6.50	465.5	73.1	2.328	320.4	0.165	0.2495	428.	280.	0.00849	1.09	0.48	1.26	3.82	-0.002	1.38
8.50	457.8	74.9	2.098	355.6	0.189	0.3088	473.	327.	0.00698	0.85	0.42	1.02	4.36	-0.010	1.07
9.50	453.9	75.8	1.990	374.9	0.202	0.3397	417.	268.	0.00912	1.05	0.50	1.20	3.53	-0.019	1.13
10.50	449.9	76.7	1.886	395.5	0.215	0.3712	436.	289.	0.00827	0.94	0.47	1.09	3.76	-0.023	1.00
11.50	445.8	77.7	1.788	417.2	0.228	0.4033	444.	296.	0.00802	0.88	0.46	1.03	3.81	-0.027	0.92
13.50	437.2	79.7	1.605	464.7	0.255	0.4679	449.	302.	0.00788	0.82	0.47	0.95	3.79	-0.037	0.79
15.50	428.1	81.8	1.442	517.2	0.282	0.5307	449.	302.	0.00797	0.78	0.49	0.90	3.69	-0.049	0.70
17.50	418.7	84.3	1.298	574.6	0.310	0.5899	439.	291.	0.00847	0.79	0.52	0.87	3.46	-0.066	0.64
19.50	408.6	87.0	1.170	637.4	0.339	0.6446	445.	308.	0.00795	0.70	0.52	0.80	3.54	-0.076	0.56
21.50	395.5	89.8	1.051	709.6	0.371	0.6954	425.	277.	0.00935	0.78	0.59	0.87	3.09	-0.108	0.55
RUN 60- 503 WEIGHT FLOW, 0.0799 HEAT INPUT, 18.99 INLET BULK TEMP, 91.6 OUTLET BULK TEMP, 166.6 PLOT CH H															
2.50	385.9	98.0	0.872	475.1	0.236	0.7820	330.	213.	0.01162	1.32	1.03	1.39	2.17	-0.252	0.58
4.50	379.3	103.5	0.785	528.2	0.255	0.8232	325.	207.	0.01285	1.37	1.13	1.44	2.00	-0.335	0.54
6.50	372.6	109.3	0.710	583.5	0.273	0.8566	354.	238.	0.01041	1.10	0.99	1.16	2.17	-0.318	0.46
8.50	365.8	115.2	0.648	639.6	0.293	0.8829	395.	281.	0.00807	0.84	0.83	0.90	2.44	-0.283	0.38
9.50	362.2	118.2	0.620	668.7	0.303	0.8942	343.	227.	0.01230	1.20	1.12	1.26	1.92	-0.462	0.43
10.50	358.7	121.2	0.594	698.3	0.313	0.9043	361.	246.	0.01073	1.05	1.01	1.10	2.03	-0.428	0.40
11.50	355.0	124.3	0.569	728.8	0.324	0.9135	364.	248.	0.01078	1.04	1.01	1.08	2.00	-0.456	0.38
13.50	347.7	130.5	0.524	791.4	0.344	0.9292	369.	254.	0.01087	1.01	1.01	1.05	1.94	-0.513	0.36
15.50	339.9	136.9	0.483	858.0	0.366	0.9419	379.	265.	0.01049	0.94	0.98	0.99	1.93	-0.547	0.33
17.50	331.9	143.4	0.447	927.9	0.388	0.9522	389.	275.	0.01021	0.89	0.95	0.93	1.91	-0.585	0.31
19.50	323.4	149.4	0.415	998.8	0.412	0.9999	401.	287.	0.00975	0.84	0.96	0.87	1.92	-0.605	0.28
21.50	313.0	155.4	0.384	1079.0	0.439	0.9999	379.	265.	0.01227	1.01	1.05	1.05	1.70	-0.821	0.28
RUN 61- 507 WEIGHT FLOW, 0.0870 HEAT INPUT, 19.13 INLET BULK TEMP, 82.1 OUTLET BULK TEMP, 144.0 PLOT CH I															
2.50	325.6	87.5	0.872	517.3	0.280	0.7361	325.	207.	0.01121	1.34	0.95	1.43	2.37	-0.176	0.55
4.50	320.3	92.2	0.779	579.1	0.303	0.7848	332.	214.	0.01101	1.25	0.96	1.34	2.32	-0.213	0.49
6.50	313.2	97.2	0.697	647.3	0.328	0.8258	358.	242.	0.00931	1.03	0.88	1.11	2.49	-0.216	0.41
8.50	304.7	102.5	0.625	722.4	0.354	0.8597	400.	285.	0.00738	0.80	0.77	0.87	2.78	-0.202	0.34
9.50	299.8	105.2	0.591	763.3	0.369	0.8744	353.	236.	0.01031	1.06	0.97	1.12	2.24	-0.306	0.37
10.50	294.3	108.0	0.559	807.1	0.384	0.8877	373.	257.	0.00902	0.92	0.90	0.98	2.38	-0.288	0.33
11.50	288.3	110.7	0.529	852.7	0.401	0.8995	374.	258.	0.00914	0.91	0.91	0.97	2.33	-0.312	0.32
13.50	274.6	116.2	0.472	955.2	0.441	0.9199	384.	269.	0.00883	0.85	0.89	0.91	2.31	-0.341	0.29
15.50	259.2	121.8	0.420	1075.2	0.487	0.9368	393.	279.	0.00860	0.80	0.87	0.85	2.29	-0.372	0.26
17.50	243.1	127.5	0.372	1213.4	0.539	0.9505	402.	288.	0.00842	0.76	0.85	0.81	2.26	-0.404	0.23
19.50	225.5	133.3	0.327	1380.3	0.602	0.9618	404.	289.	0.00866	0.76	0.86	0.80	2.17	-0.458	0.21
21.50	207.1	139.3	0.286	1580.3	0.677	0.9709	377.	261.	0.01106	0.93	1.02	0.98	1.87	-0.641	0.20
RUN 63- 502 WEIGHT FLOW, 0.1040 HEAT INPUT, 19.06 INLET BULK TEMP, 84.3 OUTLET BULK TEMP, 133.9 PLOT CH K															
2.50	363.5	88.4	0.979	551.1	0.294	0.7089	298.	178.	0.01492	1.42	0.97	1.50	2.01	-0.226	0.70
4.50	354.6	91.9	0.882	611.3	0.318	0.7542	295.	175.	0.01609	1.45	1.06	1.53	1.90	-0.291	0.65
6.50	344.9	95.7	0.797	676.9	0.344	0.7937	325.	207.	0.01209	1.13	0.88	1.20	2.16	-0.257	0.53
8.50	334.3	99.8	0.720	748.9	0.372	0.8280	367.	251.	0.00891	0.84	0.73	0.90	2.51	-0.219	0.42
9.50	328.8	101.9	0.685	787.3	0.386	0.8431	315.	196.	0.01420	1.24	1.03	1.30	1.93	-0.374	0.48
10.50	323.2	104.1	0.652	827.3	0.401	0.8571	333.	215.	0.01204	1.06	0.92	1.11	2.07	-0.339	0.44
11.50	317.7	106.3	0.621	868.7	0.416	0.8699	336.	218.	0.01196	1.04	0.92	1.09	2.06	-0.358	0.42
13.50	306.0	110.7	0.564	956.3	0.449	0.8920	344.	227.	0.01154	0.98	0.91	1.03	2.05	-0.388	0.38
15.50	293.8	115.2	0.513	1051.9	0.486	0.9105	353.	236.	0.01112	0.92	0.89	0.97	2.05	-0.415	0.34
17.50	279.0	119.7	0.463	1165.9	0.531	0.9267	362.	245.	0.01071	0.87	0.87	0.91	2.05	-0.441	0.31
19.50	261.0	124.3	0.412	1308.0	0.586	0.9408	373.	257.	0.01010	0.80	0.84	0.84	2.07	-0.456	0.27
21.50	239.0	128.9	0.361	1494.7	0.661	0.9534	349.	233.	0.01296	0.99	1.01	1.03	1.80	-0.640	0.26
RUN 65- 500 WEIGHT FLOW, 0.1357 HEAT INPUT, 19.21 INLET BULK TEMP, 68.6 OUTLET BULK TEMP, 86.8 PLOT CH M															
2.50	383.8	70.0	2.191	321.3	0.180	0.2470	279.	155.	0.01580	1.77	0.64	1.90	2.22	-0.012	1.76
4.50	377.7	71.1	1.990	353.8	0.204	0.2971	270.	145.	0.01816	1.83	0.70	1.94	2.04	-0.032	1.64
6.50	370.8	72.2	1.802	390.7	0.230	0.3506	299.	177.	0.01287	1.43	0.56	1.55	2.45	-0.036	1.28
8.50	363.0	73.4	1.626	432.9	0.257	0.4068	344.	224.	0.00897	1.07	0.45	1.20	3.05	-0.035	0.96
9.50	359.0	74.0	1.545	455.7	0.271	0.4352	293.	170.	0.01400	1.40	0.62	1.51	2.30	-0.063	1.10
10.50	354.9	74.6	1.467	479.8	0.285	0.4635	317.	196.	0.01115	1.18	0.54	1.30	2.62	-0.057	0.94
11.50	350.4	75.3	1.393	505.4	0.299	0.4917	319.	197.	0.01104	1.15	0.55	1.26	2.62	-0.064	0.88
13.50	341.1	76.8	1.256	560.7	0.329	0.5467	336.	209.	0.01021	1.04	0.55	1.15	2.72	-0.073	0.75
15.50	331.2	78.5	1.131	622.2	0.361	0.5994	347.	222.	0.00942	0.94	0.54	1.04	2.83	-0.083	0.65
17.50	321.1	80.5	1.021	689.5	0.395	0.6488	345.	225.	0.00937	0.90	0.56	0.98	2.79	-0.099	0.58
19.50	309.9	82.6	0.920	765.4	0.431	0.6949	358.	239.	0.00867	0.81	0.55	0.89	2.89	-0.108	0.50
21.50	296.3	84.8	0.824	854.6	0.474	0.7380	331.	211.	0.01073	0.94	0.66	1.01	2.48	-0.156	0.50
RUN 66- 508 WEIGHT FLOW, 0.0651 HEAT INPUT, 14.33 INLET BULK TEMP, 86.1 OUTLET BULK TEMP, 152.6 PLOT CH N															
2.50	304.3	92.0	0.736	459.3	0.241	0.7968	258.	166.	0.01351	1.75	1.32	1.82	1.81	-0.356	0.55
4.50	298.4	97.1	0.660	512.0	0.260	0.8357	272.	181.	0.01198	1.54	1.24	1.61	1.86	-0.380	0.48
6.50	291.6	102.6	0.594	568.8	0.279	0.8675	293.	203.	0.00999	1.28	1.11	1.34	1.98	-0.373	0.41
8.50	283.9	108.3	0.536	630.4	0.300	0.8934	329.	240.	0.00764	0.97	0.93	1.03	2.22	-0.331	0.34
9.50	279.9	111.1	0.511	661.8	0.311	0.9041	290.	200.	0.01127	1.35	1.23	1.41	1.80	-0.522	0.37
10.50	275.8	113.9	0.487	694.4	0.323	0.9137	309.	221.	0.00946	1.14	1.00	1.19	1.94	-0.466	0.34
11.50	271.4	116.7	0.464	728.7	0.336	0.9224	308.	219.	0.00982	1.16	1.11	1.21	1.88	-0.513	0.33
13.50	262.3	122.6	0.422	801.2	0.361	0.9373	318.	229.	0.00947	1.08	1.00	1.13	1.87	-0.553	0.30
15.50	253.1	128.5	0.384	879.4	0.389	0.9495	330.	242.	0.00888	0.99	1.02	1.03	1.89	-0.574	0.27
17.50	243.0	134.5	0.350	966.7	0.419	0.9595	343.	255.	0.00837	0.91	0.96	0.95	1.90	-0.593	0.24
19.50	230.9	140.6	0.316	1070.4	0.456	0.9680	345.	258.	0.00862	0.91	0.98	0.95	1.83	-0.668	0.22
21.50	216.9	146.4	0.283	1193.6	0.501	0.9749	326.	238.	0.01105	1.12	1.16	1.16	1.62	-0.928	0.22

HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VIS-KAT	PHI-B	PHI-F	EFLUX	DwDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, -0.05 TEST VOLTAGE, 34.3 HEAT INPUT/UNIT AREA, 1.753 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3497066.	885594.	3084975.	1.710	0.612	2.0495	8.204	0.4245	0.3398	0.00494	1.75	0.549	240.7	0.51	1.60
3941318.	963562.	2944154.	1.348	0.612	1.5334	8.460	0.4518	0.3389	0.00472	1.75	0.558	245.7	0.56	1.56
4371982.	873464.	2431012.	1.342	0.629	1.0811	10.653	0.4679	0.3496	0.00435	1.75	0.522	233.3	0.53	1.60
4761531.	764206.	1924928.	1.250	0.650	0.7642	13.756	0.4664	0.3686	0.00391	1.76	0.477	218.5	0.49	1.71
4932560.	1044638.	7375423.	1.208	0.627	0.7395	9.802	0.4644	0.3453	0.00401	1.75	0.545	242.8	0.60	1.55
5087828.	982514.	2133853.	1.165	0.637	0.6283	10.954	0.4613	0.3528	0.00380	1.75	0.521	235.2	0.58	1.60
5227221.	987975.	2032604.	1.116	0.641	0.5480	11.236	0.4562	0.3560	0.00364	1.75	0.513	233.6	0.57	1.62
5459931.	1042937.	1929954.	1.001	0.645	0.4263	11.095	0.4410	0.3585	0.00330	1.75	0.510	234.2	0.58	1.63
5632355.	1128618.	1897588.	0.891	0.647	0.3384	10.481	0.4231	0.3585	0.00316	1.75	0.513	237.5	0.59	1.63
5749680.	1274648.	1467729.	0.801	0.645	0.2760	9.272	0.4056	0.3541	0.00299	1.75	0.530	245.4	0.63	1.59
5821367.	1268931.	1831721.	0.733	0.653	0.2175	9.499	0.3895	0.3616	0.00274	1.76	0.507	242.5	0.60	1.65
5866582.	1554423.	2099545.	0.683	0.644	0.1845	7.449	0.3744	0.3482	0.00269	1.75	0.558	259.7	0.68	1.54
HEAT BALANCE, -0.05 TEST VOLTAGE, 29.5 HEAT INPUT/UNIT AREA, 1.337 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3200772.	1358408.	1647434.	0.620	0.619	0.1407	4.010	0.3490	0.3264	0.00352	1.33	0.944	193.5	1.19	1.35
3141072.	1486406.	1727907.	0.601	0.620	0.1143	3.445	0.3351	0.3255	0.00328	1.33	1.007	201.5	1.27	1.34
3070957.	1332858.	1505352.	0.592	0.639	0.0881	3.889	0.3251	0.3378	0.00290	1.34	0.841	193.4	1.06	1.45
2997364.	1141255.	1260742.	0.591	0.659	0.0685	4.665	0.3199	0.3585	0.00252	1.34	0.676	182.5	0.83	1.62
2959610.	1503465.	1636343.	0.592	0.640	0.0687	3.108	0.3179	0.3358	0.00266	1.33	0.935	205.8	1.18	1.43
2921501.	1396900.	1508136.	0.593	0.649	0.0612	3.292	0.3161	0.3445	0.00250	1.34	0.827	200.2	1.04	1.50
2883340.	1406988.	1506259.	0.596	0.652	0.0563	3.294	0.3147	0.3466	0.00241	1.34	0.821	201.7	1.03	1.52
2807272.	1421406.	1500054.	0.601	0.657	0.0481	3.121	0.3126	0.3513	0.00223	1.34	0.806	204.6	1.01	1.56
2733082.	1398011.	1458740.	0.608	0.663	0.0413	3.075	0.3113	0.3586	0.00205	1.34	0.763	205.1	0.96	1.62
2660935.	1379958.	1426712.	0.615	0.669	0.0361	3.014	0.3108	0.3656	0.00190	1.34	0.727	206.1	0.91	1.68
2597453.	1346311.	1346416.	0.623	0.673	0.0002	3.018	0.3135	0.3729	0.00177	1.34	0.686	205.8	0.87	1.76
2538422.	1505283.	1505387.	0.631	0.671	0.0002	2.461	0.3165	0.3651	0.00174	1.34	0.816	218.5	1.05	1.69
HEAT BALANCE, 0.04 TEST VOLTAGE, 29.7 HEAT INPUT/UNIT AREA, 1.347 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3777952.	1387849.	1787954.	0.655	0.620	0.1589	4.892	0.3597	0.3123	0.00384	1.34	0.913	198.3	1.16	1.25
3727262.	1429057.	1747617.	0.623	0.628	0.1237	4.619	0.3428	0.3158	0.00350	1.34	0.895	200.2	1.13	1.28
3652940.	1309519.	1539041.	0.605	0.645	0.0934	5.072	0.3286	0.3278	0.00309	1.35	0.778	193.5	0.97	1.38
3572655.	1126591.	1282745.	0.596	0.663	0.0698	6.028	0.3165	0.3491	0.00268	1.35	0.640	182.9	0.78	1.55
3530585.	1466609.	1440435.	0.534	0.648	0.0680	4.157	0.3111	0.3271	0.00279	1.34	0.816	203.9	1.03	1.37
3488021.	1350464.	1492956.	0.593	0.657	0.0588	4.583	0.3061	0.3372	0.00260	1.35	0.726	197.7	0.91	1.45
3447606.	1376787.	1504992.	0.595	0.659	0.0529	4.394	0.3033	0.3383	0.00252	1.35	0.726	199.9	0.91	1.46
3367355.	1366922.	1466164.	0.601	0.666	0.0421	4.302	0.2984	0.3450	0.00231	1.35	0.691	200.7	0.86	1.52
3287784.	1360862.	1437329.	0.610	0.672	0.0335	4.192	0.2946	0.3513	0.00214	1.35	0.661	201.8	0.82	1.57
3208297.	1356005.	1414570.	0.619	0.677	0.0267	4.076	0.2919	0.3576	0.00199	1.35	0.634	203.2	0.78	1.62
3131376.	1392790.	1438232.	0.628	0.680	0.0214	3.797	0.2900	0.3600	0.00187	1.35	0.631	207.3	0.78	1.64
3056366.	1612618.	1651096.	0.637	0.677	0.0177	2.961	0.2890	0.3473	0.00184	1.35	0.749	222.9	0.96	1.54
HEAT BALANCE, 0.01 TEST VOLTAGE, 29.5 HEAT INPUT/UNIT AREA, 1.342 ID, 0.188 OD, 0.250 LENGTH, 24.0														
4366551.	1462426.	2565528.	0.674	0.601	0.2032	3.719	0.3700	0.3153	0.00334	1.34	0.945	248.0	1.18	1.24
4348481.	2119123.	2640333.	0.639	0.603	0.1657	3.324	0.3551	0.3137	0.00315	1.34	1.004	255.1	1.26	1.22
4310953.	1830595.	2205833.	0.616	0.621	0.1256	4.019	0.3418	0.3179	0.00282	1.34	0.808	239.6	1.03	1.29
4259210.	1518083.	1776740.	0.602	0.646	0.0946	5.104	0.3299	0.3350	0.00247	1.34	0.638	222.1	0.80	1.43
4228812.	2037665.	2392653.	0.598	0.622	0.0952	3.256	0.3245	0.3140	0.00262	1.34	0.906	253.7	1.16	1.26
4195961.	1910506.	2165219.	0.594	0.634	0.0831	3.651	0.3194	0.3213	0.00245	1.34	0.793	244.7	1.01	1.32
4160565.	1918337.	2148261.	0.592	0.638	0.0752	3.597	0.3147	0.3227	0.00237	1.34	0.784	245.5	0.99	1.33
4088620.	1902922.	2088379.	0.593	0.645	0.0616	3.541	0.3079	0.3265	0.00221	1.34	0.751	245.8	0.95	1.36
4014922.	1841724.	2031059.	0.597	0.652	0.0508	3.507	0.3033	0.3308	0.00207	1.34	0.718	246.0	0.91	1.40
3943550.	1857074.	1976115.	0.604	0.659	0.0415	3.466	0.2991	0.3355	0.00194	1.34	0.684	246.0	0.87	1.44
3875968.	1808992.	1901601.	0.612	0.667	0.0333	3.535	0.2952	0.3422	0.00180	1.35	0.640	244.6	0.81	1.49
3813565.	2090524.	2172315.	0.621	0.664	0.0276	2.793	0.2914	0.3297	0.00180	1.34	0.775	262.1	1.00	1.40
HEAT BALANCE, 0.03 TEST VOLTAGE, 29.6 HEAT INPUT/UNIT AREA, 1.349 ID, 0.188 OD, 0.250 LENGTH, 24.0														
4467687.	1642322.	4110510.	1.578	0.591	1.3294	4.954	0.5087	0.3253	0.00440	1.35	0.694	292.6	0.77	1.39
4809378.	1923861.	4303470.	1.484	0.593	1.0858	4.415	0.5064	0.3272	0.00424	1.34	0.779	304.9	0.88	1.35
5110598.	1601296.	3448475.	1.385	0.594	0.7814	5.963	0.4999	0.3176	0.00394	1.35	0.639	278.3	0.76	1.32
5371530.	1264093.	2579341.	1.240	0.615	0.5566	8.529	0.4837	0.3188	0.00358	1.35	0.533	249.2	0.64	1.35
5483892.	1882683.	3516023.	1.162	0.594	0.5694	5.302	0.4732	0.3160	0.00367	1.35	0.695	287.2	0.85	1.27
5584560.	1624183.	2975826.	1.086	0.604	0.4778	6.529	0.4620	0.3138	0.00349	1.35	0.612	269.0	0.76	1.28
5676141.	1667136.	2926361.	1.017	0.606	0.4273	6.475	0.4509	0.3131	0.00339	1.35	0.614	269.0	0.76	1.28
5826788.	1658522.	2710054.	0.899	0.613	0.3372	6.756	0.4293	0.3122	0.00317	1.35	0.595	264.0	0.75	1.28
5940139.	1638693.	2507863.	0.810	0.623	0.2669	7.052	0.4094	0.3152	0.00295	1.35	0.572	259.1	0.72	1.29
6016000.	1716575.	2469839.	0.743	0.627	0.2170	6.778	0.3909	0.3155	0.00277	1.35	0.574	260.6	0.72	1.29
6065531.	1644567.	2297667.	0.693	0.637	0.1727	7.040	0.3738	0.3202	0.00257	1.35	0.547	256.2	0.69	1.32
6100548.	2090811.	2704874.	0.657	0.626	0.1484	5.375	0.3573	0.3081	0.00255	1.35	0.634	276.4	0.81	1.23
HEAT BALANCE, 0.01 TEST VOLTAGE, 25.7 HEAT INPUT/UNIT AREA, 1.009 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2820807.	1465883.	1760270.	0.618	0.607	0.1260	3.044	0.3373	0.3044	0.00377	1.01	1.245	180.1	1.55	1.15
2760145.	1402578.	1623618.	0.603	0.617	0.0968	3.135	0.3236	0.3046	0.00342	1.01	1.132	177.3	1.43	1.18
2692090.	1286663.	1440915.	0.596	0.633	0.0744	3.417	0.3123	0.3117	0.00304	1.01	0.964	171.9	1.22	1.25
2620671.	1105590.	1215295.	0.594	0.653	0.0565	4.073	0.3031	0.3287	0.00266	1.01	0.762	162.5	0.95	1.38
2585082.	1336332.	1515624.	0.597	0.638	0.0553	2.861	0.3009	0.3122	0.00275	1.01	1.038</			

TABLE IV. - Concluded. UNIFORMLY

(e) Concluded. Test section 5; tube inside diameter, 0.188 inch; tube outside

EL	PB	To	ROB	VELOC	M	X2	TO	TW	H	H/HK	H/HMw	H/HF	TW/TB	THETA	ROFM
RUN 70- 519 WEIGHT FLOW, 0.0960 HEAT INPUT, 14.80 INLET BULK TEMP, 64.5 OUTLET BULK TEMP, 85.7 PLOT CH R															
2.50	263.4	65.3	1.654	301.2	0.204	0.3142	271.	180.	0.00910	1.69	0.44	1.90	2.75	-0.014	1.07
4.50	258.4	66.0	1.448	344.0	0.234	0.3809	311.	221.	0.00671	1.25	0.40	1.47	3.36	-0.016	0.78
6.50	252.5	66.9	1.266	393.2	0.265	0.4498	368.	280.	0.00490	0.86	0.37	1.07	4.19	-0.017	0.56
8.50	245.9	68.1	1.108	449.3	0.298	0.5184	408.	322.	0.00414	0.67	0.37	0.86	4.72	-0.021	0.43
9.50	242.3	68.9	1.037	480.2	0.315	0.5519	353.	265.	0.00534	0.85	0.44	1.01	3.85	-0.031	0.47
10.50	238.4	69.7	0.971	513.0	0.333	0.5846	352.	264.	0.00539	0.83	0.46	0.98	3.79	-0.037	0.44
11.50	234.4	70.6	0.909	547.9	0.352	0.6162	350.	261.	0.00549	0.82	0.48	0.96	3.70	-0.043	0.41
13.50	226.1	72.7	0.799	623.7	0.391	0.6753	332.	243.	0.00613	0.86	0.55	0.98	3.34	-0.062	0.39
15.50	217.3	75.1	0.703	708.4	0.432	0.7283	334.	244.	0.00617	0.82	0.58	0.93	3.25	-0.079	0.34
17.50	208.0	77.8	0.620	803.5	0.476	0.7746	330.	241.	0.00641	0.81	0.62	0.91	3.09	-0.102	0.31
19.50	197.3	80.8	0.544	914.7	0.526	0.8150	345.	256.	0.00596	0.72	0.62	0.81	3.17	-0.114	0.27
21.50	182.7	83.8	0.470	1060.0	0.594	0.8512	330.	241.	0.00664	0.77	0.69	0.85	2.88	-0.151	0.25
RUN 72- 517 WEIGHT FLOW, 0.1070 HEAT INPUT, 15.00 INLET BULK TEMP, 68.5 OUTLET BULK TEMP, 92.9 PLOT CH I															
2.50	474.0	70.7	2.639	210.3	0.100	0.1819	265.	170.	0.01059	1.45	0.62	1.55	2.41	0.023	2.17
4.50	470.8	72.3	2.445	227.0	0.114	0.2230	268.	173.	0.01051	1.39	0.59	1.49	2.39	0.005	1.95
6.50	467.4	73.9	2.258	245.8	0.128	0.2683	300.	206.	0.00798	1.14	0.48	1.24	2.79	-0.009	1.59
8.50	464.0	75.4	2.083	266.5	0.141	0.3161	338.	246.	0.00620	0.90	0.41	1.01	3.26	-0.017	1.28
9.50	462.3	76.2	2.000	277.5	0.148	0.3407	292.	198.	0.00865	1.11	0.51	1.21	2.60	-0.031	1.39
10.50	460.5	77.0	1.921	289.0	0.155	0.3656	304.	211.	0.00790	1.03	0.48	1.13	2.73	-0.035	1.28
11.50	458.7	77.9	1.844	301.0	0.162	0.3908	325.	233.	0.00682	0.90	0.44	1.00	2.99	-0.036	1.13
13.50	454.9	79.6	1.700	326.5	0.177	0.4416	312.	219.	0.00756	0.93	0.47	1.02	2.76	-0.053	1.07
15.50	450.9	81.4	1.569	353.7	0.191	0.4917	314.	221.	0.00759	0.89	0.49	0.97	2.71	-0.068	0.98
17.50	446.7	83.4	1.450	382.7	0.205	0.5400	314.	221.	0.00769	0.86	0.50	0.94	2.65	-0.084	0.90
19.50	442.0	85.5	1.342	413.5	0.217	0.5859	331.	238.	0.00692	0.76	0.48	0.84	2.79	-0.091	0.79
21.50	436.5	87.8	1.243	446.4	0.234	0.6290	312.	219.	0.00807	0.83	0.54	0.90	2.49	-0.126	0.78
RUN 75- 497 WEIGHT FLOW, 0.0974 HEAT INPUT, 11.57 INLET BULK TEMP, 68.3 OUTLET BULK TEMP, 85.4 PLOT CH W															
2.50	399.0	69.7	2.353	214.7	0.116	0.2159	201.	121.	0.01585	1.79	0.74	1.88	1.74	-0.000	2.22
4.50	396.2	70.7	2.183	231.4	0.129	0.2552	196.	115.	0.01831	1.87	0.82	1.95	1.63	-0.027	2.11
6.50	393.0	71.8	2.022	249.8	0.142	0.2967	220.	142.	0.01166	1.45	0.59	1.54	1.97	-0.034	1.70
8.50	389.5	72.9	1.871	270.1	0.155	0.3403	249.	173.	0.00814	1.14	0.46	1.23	2.37	-0.036	1.37
9.50	387.6	73.5	1.799	280.9	0.162	0.3628	210.	131.	0.01419	1.53	0.69	1.61	1.78	-0.075	1.58
10.50	385.8	74.0	1.730	292.1	0.169	0.3855	226.	148.	0.01098	1.31	0.58	1.39	2.00	-0.067	1.39
11.50	384.0	74.6	1.663	303.8	0.176	0.4084	221.	143.	0.01185	1.35	0.62	1.42	1.92	-0.082	1.36
13.50	380.0	75.9	1.539	328.4	0.190	0.4541	218.	139.	0.01285	1.37	0.67	1.44	1.83	-0.111	1.28
15.50	376.0	77.3	1.425	354.6	0.204	0.4990	234.	157.	0.01019	1.15	0.59	1.22	2.03	-0.108	1.08
17.50	371.5	78.8	1.320	382.7	0.219	0.5425	233.	156.	0.01054	1.14	0.62	1.20	1.98	-0.133	1.01
19.50	367.4	80.4	1.227	411.9	0.233	0.5839	243.	167.	0.00943	1.03	0.59	1.09	2.07	-0.141	0.89
21.50	363.4	82.3	1.142	442.4	0.247	0.6229	222.	144.	0.01318	1.25	0.76	1.31	1.75	-0.230	0.93
RUN 76- 498 WEIGHT FLOW, 0.1104 HEAT INPUT, 11.72 INLET BULK TEMP, 67.6 OUTLET BULK TEMP, 80.2 PLOT CH X															
2.50	358.4	68.6	2.191	261.4	0.150	0.2341	201.	120.	0.01609	1.72	0.65	1.81	1.75	-0.015	2.03
4.50	354.5	69.4	2.034	281.6	0.166	0.2712	192.	111.	0.01980	1.85	0.76	1.93	1.60	-0.041	1.98
6.50	350.3	70.2	1.885	303.8	0.182	0.3106	212.	132.	0.01325	1.48	0.56	1.56	1.89	-0.043	1.62
8.50	345.6	70.9	1.743	326.5	0.199	0.3521	237.	160.	0.00929	1.18	0.44	1.27	2.25	-0.041	1.30
9.50	343.3	71.5	1.676	341.6	0.208	0.3734	200.	120.	0.01705	1.60	0.70	1.68	1.68	-0.085	1.53
10.50	340.8	71.7	1.612	355.4	0.217	0.3949	217.	138.	0.01242	1.34	0.56	1.42	1.93	-0.070	1.32
11.50	338.3	72.2	1.549	369.7	0.225	0.4165	212.	133.	0.01358	1.38	0.61	1.46	1.84	-0.085	1.30
13.50	334.1	73.2	1.435	399.2	0.243	0.4593	211.	132.	0.01406	1.37	0.65	1.44	1.80	-0.108	1.21
15.50	327.7	74.1	1.324	432.7	0.262	0.5024	219.	140.	0.01244	1.25	0.61	1.32	1.89	-0.115	1.06
17.50	322.0	75.3	1.224	467.8	0.281	0.5439	218.	139.	0.01289	1.24	0.65	1.31	1.85	-0.141	0.99
19.50	316.5	76.6	1.134	505.0	0.300	0.5838	222.	144.	0.01227	1.18	0.65	1.24	1.88	-0.157	0.89
21.50	310.7	78.0	1.051	544.8	0.320	0.6219	210.	130.	0.01591	1.36	0.82	1.42	1.66	-0.237	0.90
RUN 77- 528 WEIGHT FLOW, 0.1628 HEAT INPUT, 11.00 INLET BULK TEMP, 66.0 OUTLET BULK TEMP, 74.7 PLOT CH Y															
2.50	440.3	67.1	2.899	291.3	0.131	0.1270	188.	114.	0.01637	1.16	0.59	1.20	1.71	0.093	2.85
4.50	436.0	67.9	2.793	302.4	0.141	0.1429	178.	103.	0.02184	1.30	0.72	1.35	1.52	0.097	2.87
6.50	431.4	68.6	2.686	314.4	0.152	0.1602	204.	132.	0.01232	1.03	0.45	1.08	1.92	0.040	2.47
8.50	426.6	69.3	2.578	327.6	0.164	0.1789	232.	163.	0.00835	0.85	0.33	0.91	2.35	0.017	2.13
9.50	423.9	69.6	2.523	334.7	0.170	0.1890	193.	119.	0.01557	1.13	0.50	1.18	1.72	0.024	2.42
10.50	421.4	69.9	2.469	342.0	0.177	0.1993	201.	128.	0.01327	1.05	0.44	1.10	1.84	0.013	2.27
11.50	419.0	70.2	2.416	349.6	0.183	0.2100	206.	134.	0.01213	1.00	0.41	1.05	1.91	0.006	2.17
13.50	413.6	70.7	2.309	365.8	0.197	0.2325	214.	143.	0.01071	0.93	0.37	0.97	2.03	-0.005	1.98
15.50	408.3	71.2	2.204	383.2	0.210	0.2559	218.	147.	0.01023	0.90	0.35	0.95	2.07	-0.015	1.84
17.50	402.9	71.7	2.101	401.9	0.224	0.2800	215.	145.	0.01068	0.90	0.36	0.96	2.01	-0.026	1.76
19.50	397.3	72.2	2.002	421.9	0.239	0.3050	230.	160.	0.00886	0.80	0.32	0.86	2.22	-0.030	1.56
21.50	391.8	72.7	1.905	443.2	0.254	0.3308	212.	141.	0.01137	0.90	0.38	0.96	1.94	-0.049	1.60



HEATED SUPERCRITICAL PRESSURE RUNS

diameter, 0.250 inch; heated tube length, 24 inches; material, Inconel

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VTS-RAT	PHI-B	PHI-F	EFLUX	QDOL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE, 0.03 TEST VOLTAGE, 26.3 HEAT INPUT/UNIT AREA, 1.046 ID, 0.188 OD, 0.250 LENGTH, 24.0														
4025894.	926216.	2344413.	2.284	0.609	0.7562	8.635	0.6238	0.2956	0.00537	1.04	0.658	199.1	0.80	1.20
4287575.	776727.	1761837.	1.725	0.629	0.5189	11.646	0.5645	0.2991	0.00480	1.04	0.581	180.3	0.71	1.23
4496380.	621331.	1261457.	1.314	0.657	0.3546	16.262	0.5085	0.3246	0.00414	1.05	0.502	161.3	0.59	1.39
4656287.	566191.	1027391.	1.052	0.671	0.2560	19.059	0.4625	0.3450	0.00362	1.05	0.458	152.0	0.53	1.53
4719534.	782174.	1331218.	0.959	0.654	0.2475	13.222	0.4427	0.3172	0.00371	1.05	0.532	168.4	0.65	1.32
4771942.	8023803.	1334255.	0.884	0.655	0.2185	12.630	0.4246	0.3167	0.00357	1.05	0.536	169.7	0.66	1.31
4813575.	873909.	1351734.	0.824	0.655	0.1936	11.921	0.4078	0.3154	0.00344	1.05	0.543	171.7	0.67	1.30
4865143.	1045607.	1494974.	0.735	0.650	0.1563	9.705	0.3784	0.3068	0.00327	1.04	0.582	180.6	0.73	1.23
4879122.	1123745.	1498024.	0.679	0.653	0.1222	8.993	0.3536	0.3075	0.00303	1.04	0.583	183.0	0.73	1.23
4861068.	1227706.	1549002.	0.644	0.654	0.0967	8.043	0.3329	0.3059	0.00284	1.04	0.593	187.7	0.75	1.22
4823346.	1202624.	1451280.	0.625	0.662	0.0737	8.204	0.3153	0.3137	0.00261	1.05	0.557	185.4	0.69	1.28
4784774.	1380556.	1601005.	0.616	0.660	0.0581	6.829	0.2992	0.3060	0.00250	1.04	0.595	194.7	0.75	1.22
HEAT BALANCE,-0.06 TEST VOLTAGE, 26.3 HEAT INPUT/UNIT AREA, 1.056 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2840550.	1145416.	3054309.	1.334	0.591	2.0006	4.605	0.4443	0.3369	0.00403	1.05	0.577	232.1	0.59	1.52
3097797.	1192777.	2983886.	1.357	0.590	1.5741	4.785	0.4623	0.3355	0.00388	1.05	0.580	233.2	0.62	1.49
3338454.	1006644.	2455978.	1.306	0.595	1.1517	6.401	0.4666	0.3307	0.00366	1.06	0.498	215.6	0.55	1.47
3551201.	845355.	1976962.	1.227	0.615	0.8562	8.465	0.4634	0.3393	0.00337	1.06	0.440	199.3	0.49	1.51
3645910.	1166321.	2463256.	1.192	0.594	0.8597	5.869	0.4614	0.3302	0.00343	1.06	0.530	223.3	0.62	1.43
3732656.	1112800.	2285494.	1.158	0.598	0.7560	6.397	0.4587	0.3296	0.00332	1.06	0.506	217.8	0.60	1.43
3811866.	1008764.	2026324.	1.120	0.610	0.6537	7.417	0.4550	0.3354	0.00316	1.06	0.468	208.3	0.55	1.47
3947995.	1161607.	2129531.	1.035	0.604	0.5563	6.476	0.4445	0.3317	0.00305	1.06	0.500	216.9	0.60	1.43
4054166.	1226507.	2092112.	0.948	0.606	0.4625	6.243	0.4315	0.3320	0.00289	1.06	0.506	218.8	0.62	1.42
4133287.	1298505.	2073222.	0.868	0.608	0.3880	5.950	0.4179	0.3321	0.00274	1.06	0.512	221.3	0.63	1.41
4188780.	1245870.	1869194.	0.802	0.619	0.3166	6.388	0.4049	0.3375	0.00255	1.06	0.481	215.8	0.59	1.45
4224762.	1464019.	2089969.	0.748	0.610	0.2799	5.243	0.3928	0.3315	0.00249	1.06	0.533	228.2	0.66	1.40
HEAT BALANCE,-0.02 TEST VOLTAGE, 22.9 HEAT INPUT/UNIT AREA, 0.814 ID, 0.188 OD, 0.250 LENGTH, 24.0														
2991013.	1575205.	3678213.	1.555	0.639	1.8185	3.229	0.5006	0.3581	0.00375	0.81	0.783	253.5	0.78	1.47
3202022.	1783472.	3809152.	1.512	0.655	1.5282	2.991	0.5003	0.3643	0.00364	0.81	0.886	261.9	0.88	1.44
3392646.	1446700.	3162522.	1.430	0.596	1.1244	4.086	0.4971	0.3329	0.00350	0.81	0.640	237.9	0.71	1.37
3562013.	1186377.	2553136.	1.353	0.592	0.8437	5.537	0.4922	0.3216	0.00328	0.82	0.512	216.8	0.60	1.34
3638537.	1751292.	3373749.	1.307	0.606	0.8877	3.476	0.4879	0.3398	0.00333	0.81	0.754	250.4	0.84	1.33
3708530.	1538810.	2966668.	1.254	0.591	0.7608	4.178	0.4820	0.3267	0.00322	0.81	0.633	236.1	0.74	1.31
3772736.	1654002.	3060378.	1.197	0.592	0.7083	3.889	0.4751	0.3280	0.00317	0.81	0.675	241.1	0.78	1.30
3884292.	1186436.	3138670.	1.083	0.594	0.6043	3.569	0.4591	0.3286	0.00306	0.81	0.728	246.6	0.85	1.28
3973160.	1648310.	2742814.	0.980	0.591	0.4816	4.155	0.4425	0.3211	0.00286	0.81	0.627	234.2	0.76	1.26
4042330.	1754051.	2758001.	0.893	0.591	0.4109	3.914	0.4267	0.3201	0.00275	0.81	0.651	237.3	0.79	1.24
4090507.	1697151.	2555529.	0.823	0.594	0.3407	4.148	0.4120	0.3172	0.00259	0.82	0.611	231.9	0.75	1.24
4120544.	2130266.	3019378.	0.767	0.591	0.3141	3.091	0.3986	0.3205	0.00258	0.81	0.789	252.5	0.95	1.21
HEAT BALANCE,-0.00 TEST VOLTAGE, 22.9 HEAT INPUT/UNIT AREA, 0.825 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3668813.	1782555.	4239230.	1.729	0.628	1.5720	3.519	0.5283	0.3498	0.00354	0.82	0.719	279.5	0.74	1.41
3894144.	2085226.	4510840.	1.645	0.651	1.3656	3.108	0.5263	0.3606	0.00344	0.82	0.856	292.0	0.86	1.39
4099659.	1752788.	3820761.	1.571	0.601	1.0346	4.042	0.5235	0.3317	0.00331	0.82	0.643	268.8	0.72	1.32
4285670.	1455660.	3115273.	1.464	0.592	0.7881	5.372	0.5145	0.3154	0.00313	0.83	0.516	246.0	0.61	1.28
4369945.	2178353.	4150749.	1.399	0.617	0.8388	3.321	0.5073	0.3420	0.00317	0.82	0.795	285.1	0.87	1.29
4448736.	1863527.	3606721.	1.329	0.594	0.7140	4.116	0.4989	0.3229	0.00307	0.82	0.640	266.1	0.74	1.25
4522083.	2015844.	3748577.	1.257	0.597	0.6689	3.802	0.4896	0.3262	0.00303	0.82	0.687	272.2	0.79	1.25
4644845.	2153450.	3768226.	1.123	0.597	0.5703	3.609	0.4700	0.3251	0.00292	0.82	0.718	275.1	0.83	1.22
4758269.	2095222.	3503185.	1.009	0.592	0.4681	3.850	0.4511	0.3160	0.00279	0.82	0.673	268.3	0.80	1.19
4844800.	2228522.	3531077.	0.916	0.592	0.4009	3.633	0.4334	0.3146	0.00269	0.82	0.703	271.5	0.84	1.17
4910384.	2247335.	3403061.	0.841	0.592	0.3380	3.655	0.4169	0.3109	0.00257	0.82	0.690	269.5	0.84	1.15
4958633.	2269077.	3828234.	0.782	0.594	0.3047	2.943	0.4017	0.3161	0.00253	0.82	0.846	286.3	1.00	1.13
HEAT BALANCE,-0.15 TEST VOLTAGE, 22.5 HEAT INPUT/UNIT AREA, 0.777 ID, 0.188 OD, 0.250 LENGTH, 24.0														
3822061.	2589604.	6304453.	1.369	0.707	3.5472	2.576	0.4237	0.3821	0.00212	0.78	0.542	385.7	0.46	1.61
4040838.	3022040.	6562498.	1.392	0.792	3.3324	2.288	0.4376	0.4030	0.00208	0.78	0.690	408.3	0.56	1.61
4265115.	2243371.	5804368.	1.426	0.626	2.5177	3.352	0.4521	0.3537	0.00213	0.78	0.422	363.7	0.40	1.54
4493919.	1744547.	4907253.	1.471	0.591	1.9792	4.783	0.4674	0.3316	0.00212	0.78	0.318	329.0	0.33	1.49
4610514.	2643501.	6168938.	1.495	0.657	2.2006	2.976	0.4750	0.3663	0.00210	0.78	0.508	384.6	0.48	1.52
4725729.	2437272.	5857896.	1.513	0.627	1.9805	3.353	0.4815	0.3538	0.00210	0.78	0.447	371.7	0.44	1.49
4839785.	2333658.	5651741.	1.522	0.613	1.8150	3.616	0.4867	0.3467	0.00209	0.78	0.418	364.3	0.43	1.47
5067906.	2204072.	5321108.	1.511	0.595	1.5468	4.060	0.4925	0.3368	0.00206	0.78	0.385	353.9	0.41	1.44
5288013.	2194937.	5155469.	1.472	0.594	1.3509	4.272	0.4937	0.3329	0.00203	0.78	0.375	350.4	0.41	1.41
5498056.	2318575.	5205679.	1.433	0.595	1.2123	4.161	0.4937	0.3328	0.00200	0.78	0.390	355.0	0.43	1.39
5698108.	2098020.	4682157.	1.401	0.590	1.0246	4.904	0.4937	0.3259	0.00195	0.78	0.345	338.5	0.40	1.37
5886724.	2548472.	5262106.	1.367	0.596	0.9746	3.987	0.4929	0.3322	0.00194	0.78	0.415	361.7	0.47	1.35

TABLE V. - UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(a) Tube inside diameter, 0.507 inch; tube outside diameter, 0.527 inch; heated tube length, 24 inches

EL	PB	TO	ROB	VELOC	X	X2	TC	Tw	H	XTTSUB	XTTSUP	YSUB	YSUP	SIMPLE	H/HSUB	H/HSUP
RUN 1-1146 WEIGHT FLOW, 0.0940 HEAT INPUT, 27.88 HEAT FLUX, 0.73 INLET TEMP, 51.0 OUTLET TEMP, 100.0 VOLTS DROP, 44.9																
2.50	110.2	53.0	1.898	35.4	C.1700	0.1185	936.	928.	0.00083	0.4390	0.6220	1.38	1.08	33.2	2.00	2.00
4.50	109.8	53.0	1.301	51.6	0.3470	0.2228	873.	865.	0.00090	0.1930	0.3270	1.82	1.31	33.2	1.90	1.79
6.50	109.5	53.0	0.972	69.0	0.5340	0.3335	873.	864.	0.00090	0.0960	0.1970	2.01	1.41	33.2	1.77	1.59
8.50	109.0	52.9	0.775	86.7	0.7220	0.4453	898.	890.	0.00087	0.0460	0.1270	2.11	1.45	33.2	1.65	1.44
9.50	108.8	52.9	0.703	95.5	0.8150	0.5011	964.	956.	0.00081	0.0270	0.1000	2.11	1.45	33.2	1.58	1.36
10.50	108.6	52.9	0.643	104.4	0.9050	0.5570	957.	949.	0.00081	0.0130	0.0820	2.14	1.46	33.2	1.54	1.32
11.50	108.4	52.8	0.600	103.3	-C.	0.5487	976.	968.	0.00080	-0.	0.0830	-0.00	1.46	33.2	0.	1.32
13.50	108.0	52.4	0.503	133.4	-C.	0.6713	904.	895.	0.00087	-0.	0.0550	-0.00	1.43	33.2	0.	1.22
15.50	107.6	62.8	0.416	161.3	-C.	0.7508	931.	923.	0.00085	-0.	0.0380	-0.00	1.36	33.2	0.	1.11
17.50	107.1	65.6	0.349	192.6	-C.	0.8133	825.	817.	0.00098	-0.	0.0300	-0.00	1.33	33.2	0.	1.07
19.50	106.7	77.6	0.296	226.6	-0.	0.8600	791.	782.	0.00104	-0.	0.0230	-0.00	1.27	33.2	0.	1.00
21.50	106.2	86.1	0.257	261.5	-C.	0.8931	732.	723.	0.00114	-0.	0.0190	-0.00	1.20	33.2	0.	0.94
RUN 2-1152 WEIGHT FLOW, 0.1848 HEAT INPUT, 22.04 HEAT FLUX, 0.58 INLET TEMP, 46.9 OUTLET TEMP, 55.0 VOLTS DROP, 39.2																
2.50	140.6	50.4	1.647	36.2	C.	0.0164	449.	441.	0.00148	-0.	6.7740	0.	0.39	56.9	0.	2.19
4.50	140.2	52.8	1.457	38.2	-C.	0.0212	497.	488.	0.00132	-0.	5.0870	0.	0.38	56.9	0.	1.95
6.50	139.9	54.9	1.242	40.7	-C.	0.0282	554.	546.	0.00117	-0.	3.6880	0.	0.38	56.9	0.	1.73
8.50	139.6	55.7	1.044	48.1	0.0500	0.0566	636.	628.	0.00101	2.1270	1.7830	0.39	0.43	56.9	1.25	1.38
9.50	139.4	55.7	0.951	53.8	0.0970	0.0799	669.	661.	0.00095	1.0920	1.2440	0.51	0.46	56.9	1.16	1.23
10.50	139.2	55.7	0.873	59.6	0.1440	0.1033	693.	685.	0.00092	0.7160	0.9470	0.60	0.49	56.9	1.11	1.13
11.50	139.0	55.6	0.817	65.4	0.1900	0.1266	717.	710.	0.00088	0.5190	0.7550	0.67	0.51	56.9	1.04	1.05
13.50	138.7	55.6	0.772	77.1	0.2830	0.1734	690.	683.	0.00092	0.3310	0.5520	0.80	0.57	56.9	1.02	0.98
15.50	138.4	55.6	0.736	88.8	0.3760	0.2203	733.	726.	0.00086	0.2190	0.4080	0.86	0.59	56.9	0.96	0.88
17.50	138.0	55.6	0.712	100.6	0.4650	0.2673	658.	651.	0.00097	0.1640	0.3430	0.97	0.64	56.9	0.96	0.89
19.50	137.7	55.5	0.696	112.4	0.5610	0.3143	622.	614.	0.00103	0.1210	0.2870	1.04	0.67	56.9	0.96	0.87
21.50	137.4	55.5	0.681	124.4	0.6530	0.3615	570.	562.	0.00114	0.0890	0.2490	1.13	0.72	56.9	0.98	0.89
RUN 3-1143 WEIGHT FLOW, 0.0946 HEAT INPUT, 17.12 HEAT FLUX, 0.45 INLET TEMP, 51.1 OUTLET TEMP, 61.0 VOLTS DROP, 35.0																
2.50	107.8	52.8	2.401	28.1	0.0880	0.0695	671.	666.	0.00073	1.0250	1.2460	0.72	0.64	33.3	1.60	1.71
4.50	107.5	52.8	1.765	38.3	0.1940	0.1331	668.	662.	0.00074	0.4480	0.6530	1.00	0.77	33.3	1.46	1.47
6.50	107.3	52.7	1.375	49.1	0.3070	0.2008	679.	673.	0.00072	0.2560	0.4150	1.14	0.84	33.3	1.32	1.27
8.50	107.1	52.7	1.125	60.0	0.4210	0.2687	672.	667.	0.00073	0.1650	0.2960	1.25	0.89	33.3	1.25	1.17
9.50	107.0	52.7	1.031	65.5	0.4770	0.3026	698.	693.	0.00070	0.1320	0.2490	1.27	0.90	33.3	1.19	1.10
10.50	106.9	52.7	0.951	71.0	0.5340	0.3366	697.	681.	0.00071	0.1080	0.2190	1.30	0.91	33.3	1.17	1.07
11.50	106.8	52.7	0.883	76.5	0.5900	0.3706	686.	690.	0.00070	0.0870	0.1900	1.32	0.92	33.3	1.13	1.03
13.50	106.5	52.7	0.822	87.5	0.7030	0.4386	663.	657.	0.00074	0.0570	0.1510	1.39	0.96	33.3	1.12	1.00
15.50	106.3	52.6	0.785	98.6	0.8160	0.5068	708.	702.	0.00069	0.0310	0.1140	1.39	0.96	33.3	1.05	0.93
17.50	106.1	52.6	0.755	109.8	0.9290	0.5750	662.	657.	0.00074	0.0120	0.0920	1.44	0.99	33.3	1.04	0.92
19.50	105.8	52.6	0.739	114.6	-0.	0.5911	647.	641.	0.00076	-0.	0.0880	0.	0.99	33.3	0.	0.91
21.50	105.6	52.4	0.739	132.6	-C.	0.6602	598.	592.	0.00084	-0.	0.0700	0.	1.02	33.3	0.	0.90
RUN 4-1151 WEIGHT FLOW, 0.1402 HEAT INPUT, 17.95 HEAT FLUX, 0.47 INLET TEMP, 48.4 OUTLET TEMP, 56.0 VOLTS DROP, 35.2																
2.50	148.5	51.9	1.534	28.3	C.	0.0205	412.	405.	0.00133	-0.	5.9280	0.	0.43	45.6	0.	2.36
4.50	148.3	54.2	1.288	30.4	-0.	0.0290	415.	408.	0.00133	-0.	4.2980	0.	0.47	45.6	0.	2.29
6.50	148.1	56.2	1.080	32.5	-0.	0.0370	492.	485.	0.00109	-0.	3.1400	0.	0.44	45.6	0.	1.86
8.50	147.9	56.4	0.920	40.5	0.0960	0.0818	524.	518.	0.00102	1.3020	1.4230	0.59	0.53	45.6	1.46	1.52
9.50	147.8	56.4	0.825	45.0	0.1510	0.1070	556.	549.	0.00095	0.7960	1.0570	0.69	0.55	45.6	1.33	1.35
10.50	147.6	56.3	0.753	49.5	0.2060	0.1322	596.	590.	0.00088	0.5470	0.8200	0.76	0.56	45.6	1.21	1.20
11.50	147.6	56.3	0.695	54.0	0.2600	0.1575	630.	624.	0.00083	0.4030	0.6620	0.81	0.57	45.6	1.13	1.10
13.50	147.3	56.3	0.649	63.0	0.3650	0.2080	614.	608.	0.00085	0.2580	0.4940	0.94	0.62	45.6	1.09	1.02
15.50	147.1	56.3	0.619	72.0	0.4770	0.2587	648.	648.	0.00076	0.1630	0.3610	0.98	0.62	45.6	0.98	0.89
17.50	146.9	56.3	0.604	81.1	0.5860	0.3095	604.	598.	0.00087	0.1170	0.3070	1.10	0.69	45.6	1.01	0.91
19.50	146.7	56.3	0.609	90.3	0.6940	0.3634	585.	578.	0.00090	0.0780	0.2540	1.17	0.71	45.6	0.99	0.88
21.50	146.5	56.2	0.606	99.5	0.8020	0.4114	523.	517.	0.00102	0.0490	0.2220	1.28	0.77	45.6	1.01	0.91
RUN 5-1150 WEIGHT FLOW, 0.1902 HEAT INPUT, 17.70 HEAT FLUX, 0.46 INLET TEMP, 47.1 OUTLET TEMP, 57.0 VOLTS DROP, 34.9																
2.50	151.0	49.9	1.688	30.8	C.	0.0171	336.	329.	0.00166	-0.	7.8640	0.	0.37	58.3	0.	2.19
4.50	151.4	51.8	1.540	36.4	-0.	0.0209	339.	332.	0.00166	-0.	6.5210	0.	0.39	58.3	0.	2.18
6.50	151.2	53.6	1.391	40.1	-0.	0.0254	401.	394.	0.00136	-0.	4.9970	0.	0.36	58.3	0.	1.84
8.50	151.0	55.1	1.220	42.2	-0.	0.0318	419.	412.	0.00130	-0.	3.9660	0.	0.37	58.3	0.	1.73
9.50	151.0	55.9	1.135	43.3	-0.	0.0353	425.	419.	0.00128	-0.	3.5720	0.	0.38	58.3	0.	1.69
10.50	150.8	56.4	1.055	44.7	-0.	0.0400	478.	472.	0.00112	-0.	2.9860	0.	0.35	58.3	0.	1.47
11.50	150.8	56.6	0.988	48.0	0.0310	0.0536	511.	505.	0.00103	4.0100	2.1900	0.29	0.36	58.3	1.23	1.31
13.50	150.6	56.0	0.937	56.7	0.1130	0.0901	522.	515.	0.00101	1.1310	1.3090	0.48	0.42	58.3	1.12	1.15
15.50	150.4	56.0	0.897	65.3	0.1940	0.1267	513.	607.	0.00084	0.5820	0.8520	0.56	0.42	58.3	0.92	0.92
17.50	150.2	56.9	0.834	74.1	0.2760	0.1634	556.	549.	0.00094	0.4060	0.6860	0.69	0.48	58.3	0.96	0.93
19.50	150.0	56.9	0.780	82.6	0.3570	0.2002	539.	532.	0.00097	0.2930	0.5580	0.77	0.51	58.3	0.93	0.89
21.50	149.8	56.9	0.742	91.6	0.4390	0.2370	487.	481.	0.00104	0.2270	0.4830	0.88	0.56	58.3	0.97	0.91
RUN 6-1142 WEIGHT FLOW, 0.1611 HEAT INPUT, 16.84 HEAT FLUX, 0.44 INLET TEMP, 47.7 OUTLET TEMP, 52.0 VOLTS DROP, 34.1																
2.50	106.4	50.5	1.644	35.5	C.	0.0117	565.	559.	0.00087	-0.	7.0980	0.	0.25	56.0	0.	1.46
4.50	106.1	52.9	1.495	37.0	-0.	0.0144	569.	563.	0.00086	-0.	5.8690	0.	0.26	56.0	0.	1.43
6.50	105.8	52.9	1.279	47.2	0.0510	0.0470	592.	586.	0.00083	1.8400	1.9140	0.37	0.36	56.0	1.09	1.20
8.50	105.5	5														

TABLE V. - Continued, UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(b) Tube inside diameter, 0.438 inch; tube outside diameter, 0.502 inch; heated tube length, 24 inches

EL	PB	TB	ROB	VELOC	X	X2	TO	TW	H	XTTSUR	XTTSUP	YSUB	YSUP	SIMPLF	H/HSUB	H/HSUP
RUN 1-1246 WEIGHT FLOW, 0.1671 HEAT INPUT, 26.74 HEAT FLUX, 0.81 INLET TEMP, 45.3 OUTLET TEMP, 60.0 VOLTS DROP, 23.9																
2.50	156.0	45.7	3.657	48.3	0.	0.0176	484.	416.	0.00221	-0.	6.9180	0.	0.43	74.6	0.	2.43
4.50	155.4	52.7	3.471	51.4	-0.	0.0236	514.	447.	0.00205	-0.	5.0700	0.	0.43	74.6	0.	2.24
6.50	154.6	59.1	3.220	55.4	-0.	0.0327	539.	473.	0.00194	-0.	3.6420	0.	0.45	74.6	0.	2.06
8.50	154.0	56.8	2.923	61.0	0.0100	0.0476	645.	583.	0.00154	10.2170	2.3010	0.26	0.44	74.6	1.44	1.62
9.50	153.6	56.8	2.566	69.5	0.0760	0.0754	641.	579.	0.00155	1.6030	1.4840	0.51	0.50	74.6	1.41	1.48
10.50	153.2	56.8	2.285	78.1	0.1410	0.1033	729.	670.	0.00132	0.7950	1.0070	0.62	0.51	74.6	1.20	1.22
11.50	152.9	56.7	2.057	86.7	0.2060	0.1314	701.	641.	0.00138	0.5380	0.8050	0.75	0.56	74.6	1.20	1.18
13.50	152.2	56.7	1.711	104.2	0.3340	0.1879	621.	558.	0.00161	0.3170	0.5880	1.00	0.66	74.6	1.25	1.19
15.50	151.5	56.6	1.461	122.1	0.4620	0.2450	652.	590.	0.00152	0.1890	0.4210	1.09	0.69	74.6	1.14	1.05
17.50	150.6	56.6	1.272	140.2	0.5890	0.3026	627.	564.	0.00159	0.1220	0.3310	1.20	0.73	74.6	1.11	1.00
19.50	150.0	56.5	1.124	158.7	0.7150	0.3607	558.	493.	0.00185	0.0790	0.2790	1.36	0.81	74.6	1.15	1.04
21.50	145.4	56.5	1.005	177.4	0.8390	0.4192	548.	482.	0.00190	0.0410	0.2260	1.43	0.84	74.6	1.11	1.00
RUN 2-1247 WEIGHT FLOW, 0.1150 HEAT INPUT, 26.40 HEAT FLUX, 0.80 INLET TEMP, 46.3 OUTLET TEMP, 74.9 VOLTS DROP, 23.8																
2.50	160.0	52.6	3.475	31.6	0.	0.0244	526.	463.	0.00195	-0.	4.9090	0.	0.62	50.5	0.	3.15
4.50	155.0	56.2	3.068	35.7	-0.	0.0398	620.	558.	0.00159	-0.	2.7950	0.	0.62	50.5	0.	2.52
6.50	155.0	56.5	2.202	45.8	0.1650	0.1138	698.	639.	0.00137	0.6950	0.9400	0.59	0.78	50.5	1.79	1.80
8.50	154.0	56.8	1.642	66.8	0.3760	0.2043	791.	734.	0.00118	0.2360	0.4680	1.35	0.87	50.5	1.51	1.39
9.50	154.0	56.8	1.454	75.4	0.4810	0.2498	811.	724.	0.00120	0.1610	0.3720	1.48	0.91	50.5	1.47	1.32
10.50	153.0	56.8	1.304	84.1	0.5860	0.2956	816.	760.	0.00114	0.1070	0.2940	1.57	0.94	50.5	1.41	1.23
11.50	153.0	56.7	1.181	92.9	0.6500	0.3417	795.	739.	0.00117	0.0720	0.2460	1.65	0.97	50.5	1.37	1.18
13.50	152.6	56.7	0.991	110.6	0.8970	0.4343	705.	646.	0.00136	0.0230	0.1850	1.85	1.07	50.5	1.37	1.18
15.50	151.0	57.4	0.967	113.4	-0.	0.4397	732.	673.	0.00130	-0.	0.1780	0.	1.04	50.5	0.	1.14
17.50	151.0	56.2	0.808	135.8	-0.	0.5323	698.	639.	0.00138	-0.	0.1310	0.	1.07	50.5	0.	1.07
19.50	150.0	61.9	0.689	159.0	-0.	0.6117	644.	583.	0.00153	-0.	0.1030	0.	1.11	50.5	0.	1.05
21.50	145.0	65.8	0.550	185.9	-0.	0.6849	627.	565.	0.00160	-0.	0.0790	0.	1.11	50.5	0.	1.00
RUN 3-1248 WEIGHT FLOW, 0.1920 HEAT INPUT, 25.29 HEAT FLUX, 0.76 INLET TEMP, 44.8 OUTLET TEMP, 54.5 VOLTS DROP, 23.3																
2.50	126.0	45.0	2.748	48.8	0.	0.0128	574.	513.	0.00165	-0.	7.5540	0.	0.33	76.2	0.	1.95
4.50	128.0	51.8	3.540	51.7	-0.	0.0170	698.	641.	0.00130	-0.	5.1720	0.	0.31	76.2	0.	1.61
6.50	128.0	54.3	3.288	55.7	-0.	0.0242	745.	689.	0.00120	-0.	3.5980	0.	0.32	76.2	0.	1.45
8.50	127.0	54.6	2.546	71.9	0.0750	0.0671	802.	748.	0.00110	1.2470	1.3200	0.44	0.42	76.2	1.07	1.17
9.50	127.0	54.6	2.253	81.3	0.1210	0.0920	807.	732.	0.00113	0.7770	0.9790	0.55	0.47	76.2	1.06	1.11
10.50	126.0	54.6	2.019	90.7	0.1680	0.1170	810.	756.	0.00109	0.5420	0.7550	0.64	0.50	76.2	1.02	1.03
11.50	126.0	54.6	1.828	100.1	0.2150	0.1420	788.	734.	0.00113	0.4190	0.6270	0.71	0.54	76.2	1.01	1.00
13.50	125.0	54.5	1.535	119.3	0.3070	0.1922	760.	705.	0.00118	0.2760	0.4610	0.82	0.59	76.2	0.98	0.94
15.50	125.0	54.4	1.321	138.6	0.3990	0.2425	727.	671.	0.00124	0.1960	0.3610	0.90	0.63	76.2	0.95	0.89
17.50	124.0	54.4	1.157	158.3	0.4910	0.2930	681.	624.	0.00134	0.1450	0.2960	0.59	0.67	76.2	0.95	0.88
19.50	123.0	54.3	1.027	178.2	0.5830	0.3437	616.	556.	0.00152	0.1100	0.2540	1.09	0.73	76.2	0.99	0.90
21.50	123.0	54.2	0.823	198.4	0.6740	0.3946	595.	534.	0.00159	0.0790	0.2120	1.14	0.76	76.2	0.97	0.88
RUN 4-1251 WEIGHT FLOW, 0.1140 HEAT INPUT, 16.52 HEAT FLUX, 0.50 INLET TEMP, 45.9 OUTLET TEMP, 54.4 VOLTS DROP, 18.9																
2.50	126.0	50.3	3.656	29.7	0.	0.0141	602.	563.	0.00097	-0.	6.4870	0.	0.32	50.2	0.	1.78
4.50	125.0	53.2	3.425	31.7	-0.	0.0193	682.	644.	0.00085	-0.	4.5470	0.	0.32	50.2	0.	1.58
6.50	126.0	54.6	2.741	39.7	0.0450	0.0530	715.	679.	0.00080	1.9440	1.7320	0.37	0.41	50.2	1.15	1.30
8.50	125.0	54.4	2.090	52.0	0.1510	0.1076	731.	695.	0.00078	0.6300	0.8530	0.62	0.50	50.2	1.07	1.09
9.50	125.0	54.4	1.868	58.2	0.2020	0.1351	735.	699.	0.00078	0.4580	0.6730	0.70	0.54	50.2	1.04	1.03
10.50	125.0	54.4	1.688	64.4	0.2520	0.1626	734.	698.	0.00078	0.3530	0.5540	0.76	0.56	50.2	1.00	0.98
11.50	124.0	54.4	1.535	70.6	0.3030	0.1902	731.	695.	0.00078	0.2820	0.4680	0.82	0.58	50.2	0.98	0.94
13.50	124.0	54.4	1.308	83.1	0.4040	0.2453	700.	663.	0.00082	0.1930	0.3570	0.91	0.63	50.2	0.95	0.89
15.50	124.0	54.4	1.136	95.7	0.5050	0.3004	701.	664.	0.00082	0.1340	0.2770	0.96	0.65	50.2	0.91	0.83
17.50	124.0	54.3	1.003	108.3	0.6050	0.3557	659.	621.	0.00088	0.0960	0.2290	1.03	0.65	50.2	0.90	0.82
19.50	123.0	54.3	0.898	121.1	0.7060	0.4111	613.	574.	0.00096	0.0670	0.1930	1.11	0.73	50.2	0.91	0.82
21.50	123.0	54.3	0.812	133.6	0.8060	0.4664	580.	540.	0.00103	0.0420	0.1620	1.17	0.77	50.2	0.91	0.82

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(c) Tube inside diameter, 0.335 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

EL	PB	T <sub>B</sub>	ROB	VELDC	X	X2	T <sub>O</sub>	T <sub>w</sub>	H	XTTSUB	XTTSUP	YSUB	YSUP	SIMPLE	H/HSUB	H/HSUP
RUN 1- 542 WEIGHT FLOW, 0.1551 HEAT INPUT, 22.70 HEAT FLUX, 0.83 INLET TEMP, 40.8 OUTLET TEMP, 44.1 VOLTS DROP, 27.7																
2.5C	89.4	45.7	3.950	64.2	C.	0.0059	868.	830.	0.00111	-0.	9.8070	0.	0.20	104.3	0.	1.23
4.5C	87.4	49.5	3.715	68.2	-0.	0.0084	864.	827.	0.00121	-0.	7.1180	0.	0.23	104.3	0.	1.31
6.5C	85.0	50.4	2.590	97.9	0.0580	0.0475	758.	718.	0.00138	1.2880	1.5270	0.43	0.39	104.3	1.07	1.17
8.5C	82.3	50.6	1.804	140.5	C.1460	0.1027	761.	721.	0.00133	0.5240	0.7100	0.59	0.48	104.3	0.93	0.96
9.5C	80.8	49.9	1.557	162.8	C.1800	0.1300	741.	701.	0.00133	0.4020	0.5610	0.63	0.50	104.3	0.88	0.88
10.5C	79.2	49.7	1.367	185.4	C.2190	0.1568	652.	610.	0.00150	0.3440	0.4910	0.69	0.54	104.3	0.90	0.89
11.5C	77.5	49.5	1.215	208.6	0.2560	0.1831	668.	627.	0.00143	0.2790	0.4050	0.70	0.55	104.3	0.83	0.82
13.5C	74.1	45.0	C.981	256.3	C.3290	0.2361	476.	429.	0.00216	0.2420	0.3610	0.93	0.72	104.3	1.05	1.03
15.5C	70.5	48.5	C.808	313.9	C.4010	0.2905	554.	509.	0.00177	0.1630	0.2500	0.84	0.65	104.3	0.83	0.80
17.5C	66.7	48.0	C.673	376.3	C.4710	0.3459	518.	472.	0.00182	0.1270	0.2010	0.85	0.67	104.3	0.80	0.76
19.5C	62.8	47.4	C.572	443.3	0.5330	0.3984	433.	384.	0.00214	0.1100	0.1770	0.56	0.76	104.3	0.87	0.83
21.5C	58.8	46.8	C.489	518.8	0.5920	0.4513	394.	344.	0.00243	0.0900	0.1500	1.09	0.87	104.3	0.94	0.91
RUN 2- 541 WEIGHT FLOW, 0.1403 HEAT INPUT, 21.90 HEAT FLUX, 0.81 INLET TEMP, 40.6 OUTLET TEMP, 53.1 VOLTS DROP, 27.2																
2.5C	124.9	45.8	3.944	58.1	0.	0.0091	945.	909.	0.00099	-0.	7.4430	0.	0.20	96.2	0.	1.17
4.5C	123.8	49.9	3.684	62.2	-0.	0.0133	925.	889.	0.00109	-0.	5.3310	0.	0.24	96.2	0.	1.24
6.5C	122.5	53.2	3.428	66.9	-0.	0.0187	864.	827.	0.00116	-0.	4.0550	0.	0.26	96.2	0.	1.24
8.5C	121.2	54.1	2.586	88.6	C.0650	0.0619	761.	723.	0.00133	1.3290	1.4170	0.41	0.39	96.2	1.02	1.12
9.5C	120.5	54.0	2.219	103.3	0.1230	0.0916	848.	811.	0.00116	0.7040	0.9070	0.51	0.43	96.2	0.92	0.96
10.5C	120.0	53.5	1.942	118.0	0.1760	0.1216	732.	694.	0.00130	0.5180	0.7390	0.59	0.46	96.2	0.91	0.93
11.5C	119.3	53.9	1.741	131.7	0.2250	0.1487	715.	676.	0.00129	0.3990	0.6060	0.63	0.47	96.2	0.87	0.86
13.5C	118.0	53.7	1.435	159.8	0.3220	0.2039	444.	397.	0.00230	0.3350	0.5620	0.98	0.70	96.2	1.26	1.23
15.5C	116.6	53.6	1.221	187.7	0.4150	0.2573	539.	496.	0.00176	0.2070	0.3800	0.86	0.60	96.2	0.92	0.88
17.5C	115.2	53.5	1.056	216.6	C.5070	0.3115	496.	452.	0.00183	0.1540	0.3110	0.91	0.63	96.2	0.89	0.84
19.5C	113.8	53.4	C.943	243.0	0.5880	0.3596	419.	371.	0.00213	0.1260	0.2820	1.04	0.71	96.2	0.96	0.91
21.5C	112.2	53.2	C.848	270.2	0.6670	0.4075	383.	333.	0.00242	0.0970	0.2460	1.19	0.81	96.2	1.05	0.99
RUN 3- 539 WEIGHT FLOW, 0.1119 HEAT INPUT, 13.60 HEAT FLUX, 0.43 INLET TEMP, 41.5 OUTLET TEMP, 55.5 VOLTS DROP, 20.7																
2.5C	142.8	44.2	4.033	45.3	C.	0.0095	282.	247.	0.00173	-0.	15.1780	0.	0.22	80.3	0.	1.48
4.5C	142.4	46.6	3.900	46.9	-0.	0.0116	358.	326.	0.00138	-0.	10.9170	0.	0.21	80.3	0.	1.33
6.5C	142.0	48.8	2.763	48.6	-0.	0.0142	413.	384.	0.00120	-0.	8.3850	0.	0.20	80.3	0.	1.22
8.5C	141.6	50.9	3.616	50.6	-0.	0.0173	464.	436.	0.00112	-0.	6.5150	0.	0.21	80.3	0.	1.17
9.5C	141.4	52.0	3.530	51.8	-0.	0.0194	494.	466.	0.00113	-0.	5.6690	0.	0.22	80.3	0.	1.19
10.5C	141.2	53.0	3.446	53.1	-0.	0.0217	532.	505.	0.00103	-0.	4.9140	0.	0.21	80.3	0.	1.09
11.5C	141.0	53.9	3.262	54.4	-0.	0.0241	655.	630.	0.00082	-0.	3.9660	0.	0.19	80.3	0.	0.91
13.5C	140.5	55.6	3.165	57.8	-0.	0.0311	453.	424.	0.00127	-0.	3.8430	0.	0.27	80.3	0.	1.24
15.5C	140.0	55.7	2.593	70.5	0.0730	0.0682	614.	589.	0.00088	1.5370	1.5450	0.28	0.27	80.3	0.75	0.81
17.5C	139.4	55.7	2.154	84.9	C.1570	0.1101	505.	477.	0.00104	0.7850	1.0720	0.41	0.33	80.3	0.80	0.81
19.5C	138.9	55.6	1.882	97.1	0.2250	0.1455	404.	374.	0.00121	0.5870	0.9080	0.53	0.38	80.3	0.88	0.86
21.5C	138.2	55.6	1.660	108.8	C.2940	0.1788	333.	300.	0.00158	0.4790	0.8090	0.75	0.50	80.3	1.12	1.05
RUN 4- 538 WEIGHT FLOW, 0.1136 HEAT INPUT, 8.00 HEAT FLUX, 0.26 INLET TEMP, 41.3 OUTLET TEMP, 55.8 VOLTS DROP, 14.6																
2.5C	142.5	43.1	4.056	45.3	C.	0.0085	186.	160.	0.00191	-0.	20.5590	0.	0.18	81.2	0.	1.31
4.5C	142.4	44.6	4.013	46.2	-0.	0.0098	227.	204.	0.00153	-0.	16.1950	0.	0.17	81.2	0.	1.19
6.5C	142.2	46.1	3.929	47.2	-0.	0.0111	242.	220.	0.00140	-0.	13.8480	0.	0.17	81.2	0.	1.13
8.5C	142.0	47.8	3.846	48.2	-0.	0.0126	236.	213.	0.00150	-0.	12.5340	0.	0.18	81.2	0.	1.20
9.5C	141.9	48.2	3.801	48.8	-0.	0.0134	232.	209.	0.00153	-0.	11.8860	0.	0.18	81.2	0.	1.21
10.5C	141.8	48.8	3.760	49.3	-0.	0.0142	245.	223.	0.00139	-0.	10.9360	0.	0.18	81.2	0.	1.14
11.5C	141.7	49.4	3.717	49.9	-0.	0.0151	281.	260.	0.00119	-0.	9.5990	0.	0.17	81.2	0.	1.04
13.5C	141.5	50.7	3.627	51.2	-0.	0.0170	261.	239.	0.00143	-0.	8.9170	0.	0.20	81.2	0.	1.21
15.5C	141.2	52.0	3.525	52.6	-0.	0.0195	326.	307.	0.00112	-0.	6.9630	0.	0.18	81.2	0.	1.05
17.5C	141.1	52.2	3.425	54.2	-0.	0.0223	375.	357.	0.00093	-0.	5.7130	0.	0.17	81.2	0.	0.90
19.5C	140.9	54.3	3.285	56.5	-0.	0.0273	440.	423.	0.00073	-0.	4.3510	0.	0.15	81.2	0.	0.72
21.5C	140.7	55.2	3.208	57.8	-0.	0.0296	356.	338.	0.00096	-0.	4.5240	0.	0.18	81.2	0.	0.90
RUN 5- 200 WEIGHT FLOW, 0.1948 HEAT INPUT, 25.69 HEAT FLUX, 1.08 INLET TEMP, 49.2 OUTLET TEMP, 59.5 VOLTS DROP, 25.6																
2.5C	161.5	52.1	3.523	90.3	-0.	0.0353	294.	225.	0.00517	-0.	5.2750	0.	0.52	125.1	0.	2.75
4.5C	175.2	54.4	3.279	97.1	-0.	0.0456	382.	323.	0.00390	-0.	3.4520	0.	0.51	125.1	0.	2.27
6.5C	177.0	56.5	3.020	105.0	-0.	0.0579	654.	607.	0.00215	-0.	1.9840	0.	0.39	125.1	0.	1.34
8.5C	175.0	58.0	2.689	113.4	-0.	0.0813	625.	577.	0.00241	-0.	1.4610	0.	0.47	125.1	0.	1.37
9.5C	174.0	58.5	2.515	126.6	0.0430	0.0968	564.	514.	0.00251	3.2660	1.3010	0.34	0.48	125.1	1.32	1.32
10.5C	173.0	58.2	2.252	141.4	C.1480	C.1264	530.	479.	0.00260	0.9980	1.0260	0.59	0.52	125.1	1.28	1.25
11.5C	172.2	58.1	2.034	156.4	C.2490	0.1565	502.	450.	0.00276	0.5730	0.8450	0.79	0.57	125.1	1.30	1.24
13.5C	170.5	58.6	1.704	186.8	0.4370	0.2160	428.	372.	0.00341	0.2900	0.6490	1.21	0.72	125.1	1.46	1.35
15.5C	169.1	57.9	1.461	217.8	0.6100	0.2763	410.	353.	0.00363	0.1540	0.4950	1.45	0.80	125.1	1.42	1.31
17.5C	168.0	57.8	1.278	249.1	C.7480	0.3366	366.	305.	0.00424	0.0770	0.4100	1.80	0.94	125.1	1.52	1.42
19.5C	167.2	57.8	1.141	275.0	C.9470	0.3943	306.	239.	0.00558	0.0210	0.3670	2.37	1.19	125.1	1.75	1.71
21.5C	166.7	58.2	1.252	254.2	-0.	0.3409	294.	226.	0.00604	-0.	0.4630	0.	1.22	125.1	0.	1.96
RUN 6- 201 WEIGHT FLOW, 0.1613 HEAT INPUT, 25.02 HEAT FLUX, 1.06 INLET TEMP, 49.2 OUTLET TEMP, 59.5 VOLTS DROP, 25.4																
2.5C	161.4	52.8	3.483	75.7	-0.	0.0308	350.	290.	0.00380	-0.	5.0060	0.	0.51	107.5	0.	2.60
4.5C	159.0	55.3	3.204	82.2	-0.	0.0412	460.	407.	0.00304	-0.	3.1910	0.	0.51	107.5	0.	2.17
6.5C	156.6	57.0	2.723	96.8	0.0410	0.0698	707.	662.	0.00193	2.7160	1.4930	0.35	0.46	107.5	1.24	1.37
8.5C	154.5	56.9	2.617	130.6	C.2220	C.1441	651.	605.	0.00216	0.5120	0.7510	0.82	0.61	107.5	1.27	1.24
9.5C	152.5	56.8	1.796	146.7	C.3030	0.1788	590.	542.	0.00231	0.3700	0.6290	0.94	0.65	107.5	1.26	1.20
10.5C	152.4	56.7	1.615	163.2	0.3620	0.2137	546.	496.	0.00252	0.2800	0.5370	1.06	0.70	107.5	1.27	1.20
11.5C	151.4	56.6	1.465	179.8	C.4550	0.2487	512.	462.	0.00264	0.2170	0.4650	1.15	0.74	107.5	1.26	1.18
13.5C	149.6	56.5	1.241	212.4	C.6400	0.3162	423.	369.	0.00332	0.1430	0.3840	1.48	0.91	107.5	1.42	1.33
15.5C	148.0	56.4	1.075	245.1	0.7420	0.3830	403.	347.	0.00353	0.0820	0.3020	1.64	0.99	107.5	1.39	1.30
17.5C	146.7	56.3	C.947	278.2	0.8780	0.4500	373.	315.	0.00392	0.0370	0.2460	1.85	1.11			

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(c) Concluded. Tube inside diameter, 0.335 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

RUN 7- 540 WEIGHT FLOW, 0.1478 HEAT INPUT, 32.40 HEAT FLUX, 1.28 INLET TEMP, 41.1 OUTLET TEMP, 58.5 VOLTS DROP, 34.1

2.5C	110.2	48.5	3.780	63.5	-C.	0.0123	1030.	977.	0.00145	-0.	5.1320	0.	0.32	100.3	0.	1.68
4.5C	107.9	52.8	3.027	79.8	C.0260	0.0355	1022.	969.	0.00157	2.6380	1.9250	0.37	0.48	100.3	1.32	1.61
6.5C	105.0	52.5	1.814	133.1	C.1780	0.1261	964.	911.	0.00165	0.4110	0.5740	0.93	0.73	100.3	1.30	1.30
8.5C	101.8	52.2	1.272	189.7	C.3260	0.2173	891.	838.	0.00178	0.2050	0.3280	1.15	0.85	100.3	1.23	1.17
9.5C	100.0	52.0	1.104	218.7	C.3980	0.2616	858.	804.	0.00179	C.1570	0.2670	1.16	0.86	100.3	1.17	1.09
10.5C	98.1	51.8	C.573	248.3	C.4650	C.3050	755.	699.	0.00199	0.1300	0.2350	1.20	0.87	100.3	1.13	1.05
11.5C	96.2	51.6	C.868	278.2	C.5300	0.3473	763.	707.	0.00191	0.1010	0.1940	1.20	0.87	100.3	1.06	0.97
13.5C	92.2	51.2	C.706	341.9	C.6550	0.4321	532.	468.	0.00297	0.7690	0.1710	1.50	1.09	100.3	2.85	1.18
15.5C	87.9	50.7	C.585	412.8	0.7770	0.5185	619.	558.	0.00241	0.3960	0.1110	1.37	1.07	100.3	1.88	0.96
17.5C	83.4	50.2	C.450	492.6	C.8950	C.6068	606.	545.	0.00236	0.0170	0.0790	1.33	0.98	100.3	0.97	0.89
19.5C	78.7	45.6	C.444	544.1	-C.	0.6459	520.	454.	0.00273	-0.	0.0730	0.	1.06	100.3	0.	0.94
21.5C	73.9	53.2	C.346	658.0	-C.	0.7372	486.	419.	0.00302	-0.	0.0500	0.	1.09	100.3	0.	0.92

RUN 8- 203 WEIGHT FLOW, 0.1416 HEAT INPUT, 25.19 HEAT FLUX, 1.06 INLET TEMP, 49.0 OUTLET TEMP, 65.4 VOLTS DROP, 25.6

2.5C	177.1	52.7	3.466	66.8	-C.	0.0361	290.	222.	0.00518	-0.	5.1260	0.	0.68	96.9	0.	3.53
4.5C	175.0	55.6	3.162	73.2	-0.	0.0494	345.	284.	0.00445	-0.	3.3680	0.	0.73	96.9	0.	3.21
6.5C	173.0	57.6	2.780	83.2	-C.	0.0730	535.	484.	0.00261	-0.	1.7640	0.	0.58	96.9	0.	1.88
8.5C	171.2	58.1	2.172	106.6	C.1840	0.1357	695.	650.	0.00202	0.6650	0.8110	0.77	0.63	96.9	1.36	1.34
9.5C	170.3	58.0	1.872	123.6	C.3310	0.1822	635.	588.	0.00222	0.3440	0.6220	1.07	0.71	96.9	1.39	1.31
10.5C	169.5	56.0	1.663	139.2	C.4500	0.2242	572.	523.	0.00238	0.2240	0.5210	1.25	0.74	96.9	1.37	1.26
11.5C	168.7	57.9	1.494	154.9	0.5830	0.2662	533.	483.	0.00255	0.1490	0.4420	1.40	0.79	96.9	1.36	1.23
13.5C	167.2	57.8	1.243	186.2	0.8160	0.3491	442.	388.	0.00318	0.0580	0.3460	1.83	0.97	96.9	1.47	1.35
15.5C	165.5	57.8	0.910	218.9	-0.	0.0514	423.	368.	0.00328	-0.	2.7830	0.	0.61	96.9	0.	2.46
17.5C	164.8	58.8	1.042	222.1	-0.	0.4296	393.	336.	0.00369	-0.	0.2710	0.	1.11	96.9	0.	1.41
19.5C	164.0	60.0	C.914	253.1	-0.	0.4962	352.	292.	0.00348	-0.	0.2280	0.	1.03	96.9	0.	1.22
21.5C	163.5	61.4	0.821	282.0	-C.	0.5518	346.	285.	0.00455	-0.	0.1880	0.	1.34	96.9	0.	1.49

RUN 9- 204 WEIGHT FLOW, 0.1406 HEAT INPUT, 24.37 HEAT FLUX, 1.00 INLET TEMP, 49.1 OUTLET TEMP, 56.2 VOLTS DROP, 25.7

2.5C	117.9	53.6	3.393	67.7	-0.	0.0219	832.	790.	0.00145	-0.	3.5110	0.	0.34	96.4	0.	1.52
4.5C	114.5	53.4	2.134	107.6	0.1320	0.0989	732.	689.	0.00177	0.6890	0.8890	0.72	0.60	96.4	1.29	1.34
6.5C	111.3	53.1	1.554	147.8	C.2590	0.1729	677.	633.	0.00189	0.3340	0.5130	0.94	0.71	96.4	1.21	1.18
8.5C	108.3	52.8	1.203	191.0	C.3860	0.2488	622.	576.	0.00207	0.2040	0.3510	1.09	0.79	96.4	1.17	1.11
9.5C	106.8	52.7	1.083	212.2	0.4440	0.2847	585.	538.	0.00209	0.1690	0.3060	1.10	0.79	96.4	1.10	1.04
10.5C	105.5	52.6	C.986	233.0	C.4990	0.3193	546.	498.	0.00225	0.1430	0.2730	1.16	0.82	96.4	1.11	1.05
11.5C	104.2	52.4	C.901	254.9	C.5560	0.3550	515.	466.	0.00243	0.1200	0.2440	1.24	0.88	96.4	1.14	1.07
13.5C	101.8	52.2	C.768	299.1	C.6660	0.4255	423.	370.	0.00303	0.0880	0.2070	1.50	1.06	96.4	1.29	1.22
15.5C	98.8	52.0	0.673	341.2	0.7680	0.4906	404.	349.	0.00307	0.0570	0.1670	1.54	1.08	96.4	1.24	1.16
17.5C	98.2	51.8	C.600	382.5	0.8650	0.5538	370.	313.	0.00344	0.0330	0.1390	1.73	1.22	96.4	1.32	1.24
19.5C	97.2	51.7	0.543	422.7	0.9620	0.6166	317.	255.	0.00450	0.0110	0.1210	2.27	1.56	96.4	1.59	1.53
21.5C	96.5	53.3	C.509	450.8	-0.	0.6364	303.	239.	0.00493	-0.	0.1150	0.	1.66	96.4	0.	1.61

RUN 10- 535 WEIGHT FLOW, 0.1185 HEAT INPUT, 28.60 HEAT FLUX, 1.10 INLET TEMP, 42.8 OUTLET TEMP, 69.4 VOLTS DROP, 31.9

2.5C	95.4	50.3	3.655	53.0	C.	0.0126	1038.	991.	0.00122	-0.	4.7460	0.	0.34	84.0	0.	1.69
4.5C	97.3	51.7	2.174	85.0	C.1090	0.0830	1024.	997.	0.00132	0.6320	0.8100	0.80	0.68	84.0	1.38	1.44
6.5C	95.0	51.5	1.380	140.2	C.2650	C.1916	968.	921.	0.00138	0.2440	0.3680	1.10	0.83	84.0	1.24	1.19
8.5C	92.4	51.2	1.005	191.9	0.4110	0.2847	902.	855.	0.00144	0.1340	0.2320	1.21	0.84	84.0	1.15	1.09
9.5C	91.0	51.0	C.884	218.9	0.4830	0.3232	868.	821.	0.00149	0.1080	0.1920	1.25	0.92	84.0	1.13	1.03
10.5C	89.5	50.9	C.784	247.0	C.5540	0.3708	768.	719.	0.00172	0.0890	0.1690	1.32	0.97	84.0	1.14	1.04
11.5C	88.0	50.7	C.701	276.2	C.6240	0.4189	769.	720.	0.00167	0.0670	0.1400	1.30	0.96	84.0	1.07	0.97
13.5C	84.8	50.3	0.575	336.6	C.7580	0.5124	552.	495.	0.00241	0.0450	0.1190	1.51	1.11	84.0	1.18	1.09
15.5C	81.3	49.9	0.483	400.6	C.8830	0.6037	606.	552.	0.00208	0.0190	0.0790	1.41	1.05	84.0	1.04	0.94
17.5C	77.7	49.7	0.433	447.5	-C.	0.6542	603.	549.	0.00206	-0.	0.0640	0.	1.04	84.0	0.	0.91
19.5C	74.1	53.9	0.339	571.6	-C.	0.7461	532.	475.	0.00231	-0.	0.0450	0.	1.03	84.0	0.	0.85
21.5C	70.2	58.5	C.275	704.0	-C.	0.8085	496.	438.	0.00257	-0.	0.0330	0.	1.05	84.0	0.	0.85

RUN 11- 536 WEIGHT FLOW, 0.1169 HEAT INPUT, 32.50 HEAT FLUX, 1.27 INLET TEMP, 43.0 OUTLET TEMP, 81.1 VOLTS DROP, 34.5

2.5C	108.3	51.4	3.571	53.5	C.	0.0157	1060.	1007.	0.00141	-0.	4.0080	0.	0.41	83.1	0.	1.93
4.5C	106.2	52.0	1.952	95.9	0.1460	0.1069	1329.	976.	0.00152	0.4920	0.6580	1.00	0.81	83.1	1.52	1.55
6.5C	103.6	52.4	1.273	150.1	C.3340	0.2207	977.	923.	0.00159	0.1910	0.3080	1.34	0.98	83.1	1.40	1.31
8.5C	100.7	52.1	C.922	207.1	C.5150	0.3343	925.	872.	0.00168	0.0980	0.1870	1.50	1.08	83.1	1.32	1.20
9.5C	99.1	51.9	C.806	237.0	C.6050	0.3912	926.	873.	0.00165	0.0700	0.1490	1.52	1.09	83.1	1.26	1.13
10.5C	97.4	51.3	C.715	267.2	0.6910	0.4468	826.	771.	0.00180	0.0530	0.1280	1.53	1.09	83.1	1.22	1.09
11.5C	95.8	51.0	0.641	297.9	0.7730	0.5014	759.	702.	0.00196	0.0370	0.1100	1.54	1.11	83.1	1.20	1.07
13.5C	92.2	51.2	0.525	363.5	C.9360	0.6119	581.	519.	0.00266	0.0120	0.0840	1.78	1.28	83.1	1.28	1.16
15.5C	88.4	53.5	0.441	432.9	-C.	0.6792	639.	579.	0.00226	-0.	0.0600	0.	1.14	83.1	0.	0.99
17.5C	84.4	53.4	C.347	550.8	-0.	0.7664	639.	579.	0.00221	-0.	0.0350	0.	1.05	83.1	0.	0.86
19.5C	80.2	64.1	C.281	680.7	-C.	0.8271	564.	501.	0.00250	-0.	0.0300	0.	1.02	83.1	0.	0.82
21.5C	76.0	70.4	C.231	827.1	-C.	0.8707	529.	464.	0.00276	-0.	0.0220	0.	1.02	83.1	0.	0.80

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(d) Tube inside diameter, 0.188 inch; tube outside diameter, 0.250 inch; heated tube length, 24 inches

EL	P3	T3	RUB	VELOC	X	X2	TO	TW	H	XTTSUB	XTTSUP	YSUB	YSUP	SIMPLE	H/HSUB	H/HSUP
RUN 1- 568 WEIGHT FLOW, 0.1360 HEAT INPUT, 9.62 HEAT FLUX, 0.69 INLET TEMP, 45.2 OUTLET TEMP, 55.9 VOLTS DROP, 19.4																
2.50	183.5	47.2	3.464	182.6	C.	0.0173	151.	99.	0.01230	-0.	14.8170	0.	0.30	265.5	0.	2.08
4.50	181.0	47.0	3.749	188.2	-C.	0.0200	138.	94.	0.01618	-0.	13.1520	0.	0.40	265.5	0.	2.66
6.50	176.1	50.7	3.627	194.5	-0.	0.0230	173.	84.	0.02091	-0.	11.8480	0.	0.49	265.5	0.	3.20
8.50	174.5	52.2	3.514	200.8	-C.	0.0260	208.	135.	0.00826	-0.	8.7050	0.	0.27	265.5	0.	1.62
9.50	172.5	52.5	3.457	204.1	-C.	0.0275	162.	63.	0.07266	-0.	10.8690	0.	1.77	265.5	0.	11.40
10.50	170.6	53.5	3.396	207.7	-0.	0.0293	173.	85.	0.02298	-0.	9.1700	0.	0.58	265.5	0.	3.57
11.50	168.5	54.2	3.292	214.3	-C.	0.0339	182.	99.	0.01591	-0.	7.5140	0.	0.45	265.5	0.	2.66
13.50	164.2	55.3	3.195	220.8	-C.	0.0363	203.	128.	0.00963	-0.	6.2750	0.	0.33	265.5	0.	1.82
15.50	159.7	56.4	3.045	231.4	-C.	0.0421	235.	167.	0.00618	-0.	4.8150	0.	0.26	265.5	0.	1.32
17.50	155.0	58.5	2.840	248.4	0.0220	0.0537	292.	230.	0.00386	8.0320	3.2670	0.25	0.22	265.5	1.34	0.93
19.50	149.6	58.5	2.529	279.0	0.0850	0.0772	292.	229.	0.00381	2.2360	2.2670	0.35	0.24	265.5	1.14	0.89
21.50	143.8	56.0	2.244	314.4	0.1420	0.1025	229.	160.	0.00634	1.5120	1.9740	0.63	0.36	265.5	1.71	1.23
RUN 2- 577 WEIGHT FLOW, 0.0776 HEAT INPUT, 9.54 HEAT FLUX, 0.68 INLET TEMP, 45.6 OUTLET TEMP, 55.0 VOLTS DROP, 19.4																
2.50	185.6	49.1	3.743	107.6	C.	0.0178	353.	294.	0.00264	-0.	8.3720	0.	0.19	169.5	0.	1.14
4.50	184.0	51.9	3.538	113.8	-C.	0.0232	467.	413.	0.00195	-0.	5.5160	0.	0.17	169.5	0.	0.92
6.50	181.8	54.2	3.290	122.4	-C.	0.0322	454.	399.	0.00202	-0.	4.1120	0.	0.19	169.5	0.	0.92
8.50	159.1	56.1	3.090	130.3	-0.	0.0398	441.	386.	0.00210	-0.	3.4080	0.	0.21	169.5	0.	0.92
9.50	157.5	56.5	2.945	136.7	-C.	0.0472	374.	316.	0.00267	-0.	3.1980	0.	0.26	169.5	0.	1.11
10.50	155.9	57.0	2.707	148.8	C.0450	0.0642	358.	300.	0.00288	3.0960	2.4350	0.33	0.30	169.5	1.33	1.14
11.50	154.1	56.8	2.423	166.2	0.1070	0.0890	363.	305.	0.00288	1.5790	1.7460	0.43	0.34	169.5	1.20	1.08
13.50	150.2	56.5	1.982	203.1	0.2240	0.1399	336.	277.	0.00316	0.7370	1.1420	0.63	0.41	169.5	1.17	1.06
15.50	146.0	56.2	1.662	242.3	C.3300	0.1911	322.	261.	0.00328	0.4580	0.8270	0.74	0.47	169.5	1.09	1.00
17.50	141.7	55.9	1.415	284.6	C.4300	0.2433	309.	248.	0.00345	0.3130	0.6330	0.84	0.52	169.5	1.05	0.97
19.50	137.0	55.5	1.219	330.4	0.5240	0.2964	317.	256.	0.00329	0.2140	0.4800	0.84	0.53	169.5	0.91	0.86
21.50	132.0	55.1	1.056	380.5	0.6150	0.3500	302.	241.	0.00356	0.1540	0.3890	0.94	0.59	169.5	0.92	0.87
RUN 3- 559 WEIGHT FLOW, 0.0974 HEAT INPUT, 9.53 HEAT FLUX, 0.68 INLET TEMP, 42.6 OUTLET TEMP, 42.7 VOLTS DROP, 19.4																
2.50	153.7	45.8	3.946	128.0	C.	0.0120	302.	241.	0.00335	-0.	12.8190	0.	0.17	203.2	0.	1.12
4.50	151.6	48.4	3.786	133.4	-C.	0.0149	394.	337.	0.00242	-0.	8.8290	0.	0.15	203.2	0.	0.93
6.50	149.5	50.7	3.628	139.3	-C.	0.0183	477.	423.	0.00185	-0.	6.4760	0.	0.13	203.2	0.	0.75
8.50	146.8	52.7	3.469	145.7	-C.	0.0221	464.	410.	0.00192	-0.	5.4840	0.	0.14	203.2	0.	0.76
9.50	145.2	53.6	3.386	149.1	-C.	0.0242	392.	335.	0.00248	-0.	5.5500	0.	0.18	203.2	0.	0.93
10.50	143.5	54.5	3.272	154.3	-C.	0.0282	371.	313.	0.00267	-0.	4.9630	0.	0.19	203.2	0.	0.98
11.50	141.6	55.3	3.205	157.7	-C.	0.0299	377.	320.	0.00257	-0.	4.6130	0.	0.19	203.2	0.	0.94
13.50	137.4	55.5	2.723	185.5	C.0530	0.0575	332.	272.	0.00318	3.0230	2.6580	0.33	0.27	203.2	1.25	1.06
15.50	133.0	55.2	2.247	224.8	C.1300	0.0961	327.	267.	0.00325	1.2460	1.6030	0.46	0.33	203.2	1.13	1.00
17.50	127.9	54.7	1.886	267.8	0.2020	0.1353	298.	236.	0.00375	0.8000	1.1760	0.62	0.41	203.2	1.20	1.06
19.50	122.4	54.2	1.611	313.7	0.2720	0.1737	284.	221.	0.00398	0.5680	0.9100	0.71	0.46	203.2	1.16	1.03
21.50	116.2	53.4	1.370	368.9	0.3350	0.2131	259.	195.	0.00471	0.4400	0.7430	0.86	0.55	203.2	1.24	1.11
RUN 4- 558 WEIGHT FLOW, 0.0966 HEAT INPUT, 8.40 HEAT FLUX, 0.60 INLET TEMP, 43.4 OUTLET TEMP, 52.0 VOLTS DROP, 19.4																
2.50	155.5	48.0	3.931	127.4	C.	0.0125	353.	301.	0.00223	-0.	11.1240	0.	0.13	201.8	0.	0.82
4.50	153.7	48.4	3.790	132.2	-0.	0.0151	411.	362.	0.00197	-0.	8.4650	0.	0.13	201.8	0.	0.78
6.50	151.3	50.4	3.647	137.4	-C.	0.0181	466.	419.	0.00166	-0.	6.6170	0.	0.12	201.8	0.	0.68
8.50	148.4	52.3	3.504	143.0	-0.	0.0214	454.	406.	0.00172	-0.	5.7080	0.	0.13	201.8	0.	0.69
9.50	146.8	52.1	3.432	146.0	-C.	0.0232	383.	333.	0.00217	-0.	5.8260	0.	0.15	201.8	0.	0.82
10.50	145.0	53.5	3.361	149.0	-C.	0.0250	364.	313.	0.00237	-0.	5.5630	0.	0.17	201.8	0.	0.88
11.50	143.2	54.7	3.260	153.7	-C.	0.0285	370.	319.	0.00232	-0.	4.8620	0.	0.17	201.8	0.	0.86
13.50	139.2	55.7	3.022	185.8	0.0140	0.0386	357.	284.	0.00263	10.1000	3.8190	0.21	0.20	201.8	1.14	0.93
15.50	134.5	55.3	2.530	198.0	C.0810	0.0712	319.	266.	0.00283	2.0050	2.1660	0.34	0.26	201.8	1.07	0.92
17.50	129.5	54.8	2.135	234.6	0.1460	0.1058	291.	236.	0.00326	1.1500	1.5230	0.49	0.33	201.8	1.14	0.97
19.50	124.5	54.3	1.941	272.1	0.2070	0.1379	281.	226.	0.00340	0.7820	1.1580	0.57	0.37	201.8	1.09	0.95
21.50	116.0	53.6	1.579	317.3	0.2650	0.1720	260.	203.	0.00390	0.5890	0.9310	0.69	0.44	201.8	1.14	1.00
RUN 5- 562 WEIGHT FLOW, 0.1258 HEAT INPUT, 5.89 HEAT FLUX, 0.41 INLET TEMP, 41.9 OUTLET TEMP, 43.0 VOLTS DROP, 14.7																
2.50	124.7	43.3	4.082	159.9	C.	0.0072	123.	44.	0.37482	-0.	36.5730	0.	24.68	249.4	0.	188.75
4.50	122.5	44.0	4.004	163.0	-C.	0.0081	137.	76.	0.01405	-0.	27.1830	0.	0.30	249.4	0.	2.19
6.50	120.8	46.0	3.932	166.0	-C.	0.0089	181.	137.	0.00458	-0.	19.3600	0.	0.13	249.4	0.	0.96
8.50	119.0	47.2	3.859	169.2	-C.	0.0098	238.	199.	0.00276	-0.	14.8600	0.	0.10	249.4	0.	0.70
9.50	118.0	47.9	3.822	170.8	-C.	0.0102	277.	246.	0.00217	-0.	12.9810	0.	0.09	249.4	0.	0.60
10.50	117.0	48.4	3.786	172.4	-C.	0.0107	318.	282.	0.00176	-0.	11.4660	0.	0.08	249.4	0.	0.53
11.50	116.0	48.0	3.750	174.1	-C.	0.0112	359.	325.	0.00150	-0.	10.2410	0.	0.07	249.4	0.	0.48
13.50	113.8	50.0	3.676	177.6	-C.	0.0121	260.	222.	0.00242	-0.	11.3090	0.	0.10	249.4	0.	0.65
15.50	111.4	51.1	3.601	181.3	-C.	0.0132	265.	228.	0.00232	-0.	10.2660	0.	0.10	249.4	0.	0.64
17.50	108.6	52.0	3.528	185.0	-C.	0.0141	253.	214.	0.00246	-0.	9.7730	0.	0.11	249.4	0.	0.66
19.50	105.2	52.5	3.322	196.5	0.0060	0.0202	219.	179.	0.00312	22.1190	7.5080	0.21	0.13	249.4	1.34	0.77
21.50	101.0	52.1	2.937	222.2	C.0340	0.0357	191.	148.	0.00413	5.1560	4.7420	0.34	0.18	249.4	1.58	0.93
RUN 6- 530 WEIGHT FLOW, 0.0941 HEAT INPUT, 5.68 HEAT FLUX, 0.40 INLET TEMP, 44.4 OUTLET TEMP, 42.5 VOLTS DROP, 14.7																
2.50	115.4	48.2	3.922	124.4	C.	0.0089	283.	246.	0.00194	-0.	14.6550	0.	0.10	197.6	0.	0.68
4.50	117.6	47.8	3.824	127.6	-C.	0.0102	364.	330.	0.00148	-0.	11.1220	0.	0.09	197.6	0.	0.59
6.50	115.5	48.3	3.726	131.0	-C.	0.0115	443.	411.	0.00114	-0.	8.8240	0.	0.08	197.6	0.	0.49
8.50	113.2	50.7	3.629	134.5	-0.	0.0129	410.	377.	0.00124	-0.	8.2200	0.	0.09	197.6	0.	0.52
9.50	111.9	51.4	3.579	136.3	-C.	0.0136	351.	317.	0.00154	-0.	8.4910	0.	0.10	197.6	0.	0.61
10.50	110.5	52.0	3.529	138.3	-C.	0.0144	327.	291.	0.00170	-0.	8.3680	0.	0.11	197.6	0.	0.66
11.50	109.1	52.6	3.481	140.2	-C.	0.0151	337.	302.	0.00164	-0.	7.7950	0.	0.11	197.6	0.	0.64
13.50	106.1	52.6	3.016	161.8	0.0270	0.0331	283.	246.	0.00213	5.0850	4.1290	0.21	0.16	197.6	0.98	0.77
15.50	103.0	52.3	2.573	189.7	0.0660	0.0558	275.	238.	0.00219	2.2170	2.5270	0.28	0.20	197.6	0.93	0.76
17.50	99.6	52.0	2.244	217.4	0.1030	0.0770	240.	201.	0.00265	1.5240	1.9740	0.39	0.24	197.6	1.05	0.84
19.50	95.7	51.6	1.961	244.3	0.1380	0.0991	219.	178.	0.00314	1.1650	1.5940	0.49	0.30	197.6	1.15	0.91
21.50	90.2	51.0	1.701	280.9	0.1740	0.1228	189.	146.	0.00420	0.9660	1.3630	0				

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(d) Concluded. Tube inside diameter, 0.188 inch; tube outside diameter, 0.250 inch; heated tube length, 24 inches

RUN 7- 561 WEIGHT FLOW, 0.1080 HEAT INPUT, 5.67 HEAT FLUX, 0.41 INLET TEMP, 42.6 OUTLET TEMP, 42.7 VOLTS DROP, 14.7																
2.50	118.6	44.4	4.026	135.2	C.	0.0075	188.	144.	0.00389	-0.	22.1260	0.	0.13	220.8	0.	0.94
4.50	117.3	45.9	3.941	142.2	-0.	0.0084	277.	240.	0.00217	-0.	15.4410	0.	0.10	220.8	0.	0.68
6.50	116.0	47.3	3.856	145.3	-0.	0.0095	418.	385.	0.00123	-0.	10.8590	0.	0.07	220.8	0.	0.47
8.50	114.6	48.6	3.772	148.6	-0.	0.0106	412.	379.	0.00125	-0.	9.8240	0.	0.07	220.8	0.	0.47
9.50	113.9	45.3	3.729	150.3	-0.	0.0112	350.	315.	0.00155	-0.	10.2260	0.	0.09	220.8	0.	0.55
10.50	113.1	45.9	3.687	152.0	-0.	0.0118	327.	292.	0.00171	-0.	10.0890	0.	0.09	220.8	0.	0.59
11.50	112.2	50.5	3.642	153.8	-0.	0.0125	328.	293.	0.00172	-0.	9.5480	0.	0.10	220.8	0.	0.59
13.50	110.5	51.7	3.555	157.6	-0.	0.0139	277.	240.	0.00219	-0.	9.4980	0.	0.11	220.8	0.	0.70
15.50	108.5	52.7	3.469	161.5	-0.	0.0153	275.	237.	0.00221	-0.	8.6550	0.	0.12	220.8	0.	0.71
17.50	106.1	52.6	3.003	186.6	C.C280	0.0338	243.	204.	0.00264	5.3570	4.4280	0.24	0.16	220.8	1.13	0.79
19.50	102.9	52.3	2.627	213.3	C.C600	0.0525	218.	178.	0.00313	2.7530	3.0630	0.34	0.20	220.8	1.23	0.86
21.50	57.4	51.7	2.320	241.6	C.0920	0.0700	189.	146.	0.00418	1.9460	2.4720	0.49	0.27	220.8	1.50	1.02
RUN 8- 564 WEIGHT FLOW, 0.1054 HEAT INPUT, 2.61 HEAT FLUX, 0.18 INLET TEMP, 42.9 OUTLET TEMP, 42.5 VOLTS DROP, 9.8																
2.50	86.2	43.7	4.062	134.6	C.	0.0046	71.	57.	0.01308	-0.	41.7480	0.	0.73	216.5	0.	5.64
4.50	84.8	44.4	4.022	135.9	-0.	0.0049	59.	52.	0.02594	-0.	40.6140	0.	1.63	216.5	0.	12.59
6.50	83.5	45.2	3.983	137.3	-0.	0.0052	96.	57.	0.01643	-0.	37.2320	0.	0.33	216.5	0.	2.54
8.50	82.1	45.8	3.942	138.7	-0.	0.0054	151.	129.	0.00232	-0.	25.7540	0.	0.07	216.5	0.	0.54
9.50	81.5	46.2	3.922	139.4	-0.	0.0055	142.	119.	0.00257	-0.	25.9240	0.	0.08	216.5	0.	0.58
10.50	80.8	46.5	3.903	140.1	-0.	0.0057	177.	157.	0.00168	-0.	22.4450	C.	0.06	216.5	0.	0.44
11.50	80.0	46.8	3.884	140.8	-0.	0.0058	210.	192.	0.00126	-0.	20.0070	0.	0.05	216.5	0.	0.37
13.50	78.6	47.5	3.846	142.2	-0.	0.0060	215.	197.	0.00122	-0.	18.8710	0.	0.05	216.5	0.	0.36
15.50	77.2	48.1	3.808	143.6	-0.	0.0063	272.	255.	0.00088	-0.	15.9390	0.	0.04	216.5	0.	0.30
17.50	75.6	48.6	3.770	145.0	-0.	0.0065	242.	224.	0.00104	-0.	16.2560	0.	0.05	216.5	0.	0.33
19.50	73.6	49.0	3.624	150.9	C.CC40	0.0093	203.	185.	0.00136	28.6350	12.6550	0.11	0.06	216.5	0.71	0.40
21.50	71.0	48.6	3.266	167.4	C.C170	0.0181	174.	154.	0.00175	7.9120	7.3520	0.17	0.08	216.5	0.87	0.48
RUN 9- 565 WEIGHT FLOW, 0.1345 HEAT INPUT, 2.58 HEAT FLUX, 0.19 INLET TEMP, 41.9 OUTLET TEMP, 42.8 VOLTS DROP, 9.7																
2.50	89.0	42.6	4.123	165.3	C.	0.0043	72.	57.	0.01198	-0.	45.5990	0.	0.57	263.1	0.	4.43
4.50	87.2	43.2	4.091	170.6	-0.	0.0045	54.	49.	0.03518	-0.	45.9640	0.	1.99	263.1	0.	15.46
6.50	85.5	43.7	4.060	171.9	-0.	0.0046	86.	65.	0.00867	-0.	43.0390	0.	0.15	263.1	0.	1.18
8.50	83.8	44.3	4.031	173.1	-0.	0.0048	101.	66.	0.00830	-0.	38.7840	0.	0.15	263.1	0.	1.15
9.50	82.9	44.6	4.016	173.8	-0.	0.0048	74.	59.	0.01270	-0.	39.0200	0.	0.21	263.1	0.	1.64
10.50	82.1	44.8	4.001	174.4	-0.	0.0049	74.	60.	0.01288	-0.	38.1550	0.	0.22	263.1	0.	1.69
11.50	81.2	45.1	3.985	175.1	-0.	0.0050	79.	62.	0.01143	-0.	36.9070	0.	0.20	263.1	0.	1.53
13.50	79.6	45.7	3.954	176.5	-0.	0.0051	85.	65.	0.00982	-0.	34.8460	0.	0.18	263.1	0.	1.36
15.50	78.0	46.2	3.922	177.9	-0.	0.0053	92.	51.	0.04266	-0.	36.4390	0.	2.16	263.1	0.	16.53
17.50	76.2	46.7	3.891	179.3	-0.	0.0054	146.	124.	0.00244	-0.	25.3160	0.	0.06	263.1	0.	0.46
19.50	73.8	47.2	3.661	180.7	-0.	0.0055	193.	174.	0.00141	-0.	21.1620	0.	0.04	263.1	0.	0.32
21.50	71.0	47.7	3.833	182.0	-0.	0.0055	233.	215.	0.00107	-0.	18.7930	0.	0.04	263.1	0.	0.27
RUN 10- 563 WEIGHT FLOW, 0.0855 HEAT INPUT, 2.56 HEAT FLUX, 0.18 INLET TEMP, 44.3 OUTLET TEMP, 42.3 VOLTS DROP, 9.7																
2.50	81.5	45.1	3.985	111.3	C.	0.0050	256.	239.	0.00088	-0.	20.8450	0.	0.05	183.1	0.	0.33
4.50	80.5	46.0	3.932	112.8	-0.	0.0054	337.	321.	0.00073	-0.	16.6810	0.	0.05	183.1	0.	0.32
6.50	79.5	46.5	3.883	114.2	-0.	0.0058	337.	321.	0.00369	-0.	15.5870	0.	0.24	183.1	0.	0.30
8.50	78.5	47.6	3.834	115.7	-0.	0.0061	307.	291.	0.00078	-0.	15.3590	0.	0.05	183.1	0.	0.33
9.50	78.0	48.0	3.810	116.4	-0.	0.0063	274.	258.	0.00088	-0.	15.7970	0.	0.05	183.1	0.	0.35
10.50	77.5	48.4	3.786	117.1	-0.	0.0065	255.	238.	0.00095	-0.	15.9300	0.	0.05	183.1	0.	0.37
11.50	76.8	48.8	3.763	117.9	-0.	0.0067	261.	244.	0.00092	-0.	15.3060	0.	0.05	183.1	0.	0.36
13.50	75.5	49.2	3.561	124.6	C.CC60	0.0109	218.	200.	0.00119	19.8110	10.7130	0.12	0.07	183.1	0.72	0.43
15.50	73.8	49.0	3.155	140.6	C.0220	0.0216	223.	205.	0.00117	5.6410	5.5400	0.14	0.08	183.1	0.65	0.45
17.50	71.6	48.7	2.799	158.4	C.C380	0.0333	208.	190.	0.00131	3.3930	3.8240	0.18	0.10	183.1	0.69	0.49
19.50	69.0	48.3	2.502	177.2	C.0540	0.0446	193.	174.	0.00143	2.4940	2.9720	0.21	0.12	183.1	0.72	0.51
21.50	65.6	47.8	2.236	198.4	C.C700	0.0561	166.	146.	0.00183	2.0650	2.5280	0.27	0.15	183.1	0.86	0.59

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(e) Recalculation of data from reference 12; tube inside diameter, 0.313 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

FL	PH	TO	KOB	VELOC	X	X2	TD	TW	H	XTTSUB	XTTSUP	YSUB	YSUP	SIMPLE	H/HSUB	H/HSUP
RUN 1-1802 WEIGHT FLOW, 0.1770 HEAT INPUT, 2.77 HEAT FLUX, 0.23 INLET TEMP, 44.5 OUTLET TEMP, 42.9																
0.05	45.1	44.5	4.020	82.3	-C.	0.0024	-0.	249.	0.00115	0.	29.8439	0.	0.08	130.9	0.	0.64
0.64	45.0	44.5	3.770	87.8	C.0040	0.0057	-0.	192.	0.00159	21.6273	15.5782	0.23	0.12	130.9	1.41	0.81
1.36	44.6	44.4	3.480	94.9	C.0100	0.0101	-0.	230.	0.00127	8.6210	8.5032	0.20	0.13	130.9	1.08	0.76
2.86	44.0	44.3	3.010	110.0	0.0210	0.0187	-0.	256.	0.00111	4.1230	4.5467	0.21	0.15	130.9	0.89	0.73
4.36	43.4	44.2	2.840	125.3	C.0320	0.0275	-0.	267.	0.00101	2.7181	3.1002	0.22	0.16	130.5	0.77	0.68
5.86	42.5	44.0	2.340	141.3	C.0430	0.0363	-0.	278.	0.00101	2.0003	2.3240	0.24	0.18	130.9	0.73	0.68
7.40	41.5	43.9	2.090	158.5	0.0550	0.0450	-0.	256.	0.00111	1.6293	1.9543	0.28	0.21	130.9	0.79	0.72
8.44	40.7	43.7	1.940	170.6	C.0620	0.0512	-0.	253.	0.00112	1.4484	1.7273	0.29	0.22	130.9	0.77	0.71
9.40	39.6	43.6	1.810	182.8	0.0650	0.0566	-0.	220.	0.00133	1.3791	1.6562	0.35	0.26	130.9	0.91	0.80
10.40	38.7	43.3	1.690	195.7	C.0770	0.0625	-0.	268.	0.00104	1.1119	1.3524	0.29	0.23	130.9	0.67	0.64
11.40	37.5	43.0	1.580	209.8	0.0840	0.0680	-0.	166.	0.00191	1.2657	1.5453	0.50	0.34	130.9	1.23	1.01
12.00	36.6	42.5	1.510	213.1	0.0880	0.0714	-0.	261.	0.00108	0.9612	1.1726	0.32	0.25	130.9	0.68	0.65
RUN 2-1803 WEIGHT FLOW, 0.1360 HEAT INPUT, 2.71 HEAT FLUX, 0.23 INLET TEMP, 43.7 OUTLET TEMP, 41.5																
0.05	40.6	43.7	3.070	82.6	C.0130	0.0165	-0.	249.	0.00112	4.6150	4.5733	0.26	0.18	106.0	1.14	0.92
0.64	40.4	43.6	2.940	89.4	0.0240	0.0213	-0.	238.	0.00118	3.6187	4.0184	0.30	0.20	106.0	1.19	0.96
1.36	40.1	43.6	2.610	97.1	0.0310	0.0267	-0.	266.	0.00103	2.6941	3.0747	0.28	0.21	106.0	0.99	0.87
2.86	39.5	43.5	2.230	113.5	C.0460	0.0380	-0.	267.	0.00103	1.8450	2.1947	0.31	0.24	106.0	0.93	0.85
4.36	38.7	43.3	1.940	130.6	C.0600	0.0491	-0.	264.	0.00104	1.4260	1.7136	0.34	0.26	106.0	0.89	0.83
5.86	37.3	43.1	1.710	148.5	0.0740	0.0601	-0.	260.	0.00106	1.1603	1.4089	0.37	0.28	106.0	0.86	0.81
7.40	36.5	42.9	1.510	168.2	C.0880	0.0714	-0.	230.	0.00122	1.0222	1.2471	0.43	0.33	106.0	0.96	0.89
8.44	35.8	42.7	1.390	182.1	0.0970	0.0795	-0.	220.	0.00129	0.9378	1.1347	0.46	0.36	106.0	0.98	0.91
9.40	34.4	42.4	1.280	197.5	0.1000	0.0867	-0.	201.	0.00144	0.8745	1.0676	0.52	0.39	106.0	1.06	0.97
10.40	33.4	42.1	1.190	213.0	C.1150	0.0939	-0.	174.	0.00174	0.8554	1.0431	0.62	0.45	106.0	1.24	1.10
11.40	31.9	41.8	1.090	231.7	0.1240	0.1014	-0.	121.	0.00289	0.9097	1.1106	0.89	0.60	106.0	1.84	1.50
12.00	30.7	41.5	1.040	244.8	C.1290	0.1049	-0.	259.	0.00106	0.6014	0.7392	0.43	0.35	106.0	0.72	0.70
RUN 3-1804 WEIGHT FLOW, 0.0930 HEAT INPUT, 2.70 HEAT FLUX, 0.23 INLET TEMP, 42.1 OUTLET TEMP, 40.2																
0.05	33.1	42.1	2.630	65.8	0.0260	0.0229	-0.	254.	0.00108	2.9470	3.3366	0.40	0.29	78.2	1.49	1.28
0.64	32.9	42.0	2.350	73.9	0.0350	0.0295	-0.	241.	0.00115	2.2886	2.6739	0.47	0.34	78.2	1.54	1.33
1.36	32.6	42.0	2.090	83.1	0.0450	0.0372	-0.	263.	0.00104	1.7222	2.0505	0.45	0.35	78.2	1.31	1.20
2.86	31.9	41.8	1.690	102.6	C.0650	0.0534	-0.	270.	0.00100	1.1840	1.4229	0.48	0.38	78.2	1.14	1.09
4.36	31.3	41.6	1.410	123.1	0.0850	0.0698	-0.	267.	0.00102	0.9098	1.0971	0.52	0.42	78.2	1.08	1.04
5.86	30.5	41.4	1.200	144.6	C.1050	0.0861	-0.	264.	0.00103	0.7314	0.8869	0.55	0.44	78.2	1.01	0.99
7.40	29.6	41.2	1.030	168.0	0.1250	0.1031	-0.	233.	0.00119	0.6420	0.7772	0.64	0.52	78.2	1.11	1.07
8.44	28.9	41.0	0.937	184.9	C.1390	0.1143	-0.	216.	0.00131	0.5906	0.7193	0.70	0.56	78.2	1.17	1.12
9.40	28.0	40.8	0.857	202.3	C.1510	0.1245	-0.	212.	0.00134	0.5369	0.6542	0.73	0.58	78.2	1.15	1.11
10.40	27.4	40.6	0.789	219.6	C.1640	0.1356	-0.	193.	0.00151	0.5099	0.6214	0.81	0.64	78.2	1.25	1.19
11.40	26.4	40.4	0.722	240.1	0.1770	0.1401	-0.	97.	0.00402	0.6275	0.7687	1.60	1.12	78.2	2.74	2.31
12.00	25.7	40.2	0.683	253.8	C.1850	0.1526	-0.	261.	0.00104	0.3733	0.4584	0.61	0.51	78.2	0.83	0.82
RUN 4-1805 WEIGHT FLOW, 0.0630 HEAT INPUT, 2.73 HEAT FLUX, 0.23 INLET TEMP, 40.6 OUTLET TEMP, 38.9																
0.05	27.3	40.6	2.750	40.3	C.0200	0.0174	-0.	259.	0.00106	3.3723	3.8203	0.56	0.41	57.3	2.19	1.89
0.64	27.0	40.5	2.250	52.5	0.0330	0.0277	-0.	253.	0.00109	2.1355	2.5048	0.63	0.47	57.3	2.03	1.82
1.36	26.8	40.5	1.860	63.4	C.0470	0.0394	-0.	267.	0.00102	1.4882	1.7504	0.65	0.51	57.3	1.74	1.64
2.86	26.3	40.3	1.360	86.5	0.0760	0.0638	-0.	272.	0.00100	0.9222	1.0880	0.71	0.58	57.3	1.47	1.44
4.36	25.7	40.2	1.070	110.7	C.1050	0.0872	-0.	270.	0.00100	0.6636	0.7964	0.75	0.62	57.3	1.32	1.30
5.86	25.2	40.0	0.872	135.4	0.1350	0.1117	-0.	273.	0.00099	0.5063	0.6130	0.77	0.65	57.3	1.20	1.19
7.40	24.6	39.8	0.728	162.2	0.1640	0.1367	-0.	247.	0.00112	0.4280	0.5177	0.89	0.74	57.3	1.27	1.25
8.44	24.1	39.7	0.651	181.4	0.1840	0.1532	-0.	239.	0.00116	0.3796	0.4615	0.93	0.77	57.3	1.25	1.23
9.40	23.4	39.5	0.587	201.2	C.2030	0.1686	-0.	231.	0.00121	0.3413	0.4180	0.97	0.81	57.3	1.25	1.23
10.40	23.0	39.3	0.535	220.6	C.2220	0.1852	-0.	222.	0.00127	0.3116	0.3813	1.02	0.85	57.3	1.26	1.24
11.40	22.2	39.1	0.484	243.9	C.2400	0.2011	-0.	121.	0.00282	0.3717	0.4547	1.76	1.39	57.3	2.36	2.20
12.00	21.7	38.9	0.456	258.8	0.2520	0.2112	-0.	267.	0.00101	0.2376	0.2915	0.85	0.73	57.3	0.96	0.95
RUN 5-1806 WEIGHT FLOW, 0.1810 HEAT INPUT, 4.55 HEAT FLUX, 0.38 INLET TEMP, 44.4 OUTLET TEMP, 43.7																
0.05	52.2	44.4	4.020	84.3	-C.	0.0029	-0.	220.	0.00219	0.	28.7872	0.	0.15	133.3	0.	1.11
0.64	51.9	44.3	4.000	84.8	-C.	0.0030	-0.	275.	0.00167	0.	25.2080	0.	0.13	133.3	0.	0.95
1.36	51.0	44.3	3.970	85.4	-C.	0.0031	-C.	333.	0.00134	0.	21.8195	0.	0.12	133.3	0.	0.84
2.86	50.4	44.3	3.350	101.2	C.0130	0.0133	-0.	360.	0.00122	5.8055	5.6229	0.17	0.16	133.3	0.84	0.84
4.36	50.0	44.4	2.750	123.5	0.0310	0.0273	-0.	363.	0.00121	2.5767	2.8690	0.23	0.20	133.3	0.81	0.82
5.86	49.9	44.2	2.320	146.5	C.0509	0.0414	-0.	369.	0.00119	1.6156	1.9131	0.27	0.23	133.3	0.75	0.76
7.40	47.9	44.0	1.980	171.4	C.0680	0.0558	-0.	342.	0.00130	1.2340	1.4773	0.32	0.27	133.3	0.79	0.79
8.44	46.7	44.8	1.800	188.8	C.0810	0.0654	-0.	332.	0.00134	1.0456	1.2753	0.35	0.29	133.3	0.79	0.79
9.40	45.0	44.5	1.640	207.0	0.0920	0.0743	-0.	301.	0.00150	0.9511	1.1637	0.41	0.33	133.3	0.88	0.86
10.40	43.3	44.3	1.500	225.9	C.1040	0.0837	-0.	280.	0.00163	0.8605	1.0595	0.46	0.37	133.3	0.93	0.91
11.40	42.0	44.0	1.370	247.4	0.1150	0.0926	-0.	191.	0.00262	0.9161	1.1304	0.72	0.52	133.3	1.49	1.33
12.00	40.7	43.7	1.300	261.8	C.1220	0.0975	-0.	236.	0.00201	0.7680	0.9565	0.59	0.46	133.3	1.17	1.06
RUN 6-1807 WEIGHT FLOW, 0.1230 HEAT INPUT, 4.61 HEAT FLUX, 0.39 INLET TEMP, 44.6 OUTLET TEMP, 42.0																
0.05	45.2	44.6	3.276	70.5	0.0150	0.0138	-0.	235.	0.00205	5.9275	6.3580	0.48	0.31	97.9	2.29	1.70
0.64	45.0	44.5	2.940	81.0	0.0260	0.0230	-0.	358.	0.00124	2.8932	3.2146	0.32	0.27	97.9	1.17	1.18
1.36	44.6	44.4	2.480	93.0	0.0350	0.0330	-0.	363.	0.00122	1.9616	2.2762	0.36	0.31	97.9	1.11	1.12
2.86	44.9	44.3	1.940	116.4	C.0660	0.0544	-0.	342.	0.00131	1.2179	1.4538	0.46	0.38	97.9	1.10	1.11
4.36	43.0	44.2	1.590	144.8	C.0930	0.0761	-0.	327.	0.00138	0.8818	1.0793	0.53	0.43	97.9	1.08	1.07
5.86	41.4	44.9	1.330	172.8	C.1200	0.0965	-0.	318.	0.00143	0.6825	0.8443	0.58	0.48	97.9	1.04	1.04
7.40	40.4	44.6	1.130	203.3	C.1460	0.1180	-0.	279.	0.00166	0.5839	0.7227	0.70	0.57	97.9	1.15	1.13
8.44	39.2	44.4	1.020	225.8	0.1640	0.1319	-0.	276.	0.00168	0.5114	0.6396	0.72	0.59	97.9	1.12	1.10
9.40	37.4	44.0	0.920	250.5	C.1800	0.1450	-0.	271.	0.00170	0.4535	0.5686	0.75	0.61	97.9	1.10	1.08
10.40	36.1	44.8	0.836	275.0	C.1970	0.1585	-0.	259.	0.00181	0.4139	0.5221	0.81	0.66	97.9	1.14	1.11



TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(e) Continued. Recalculation of data from reference 12; tube inside diameter, 0.313 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

RUN 7-1808 WEIGHT FLOW, 0.0880 HEAT INPUT, 4.63 HEAT FLUX, 0.39 INLET TEMP, 43.1 OUTLET TEMP, 40.6																
0.05	37.7	43.1	2.780	59.4	0.0250	0.0215	-0.	243.	0.00196	3.3306	3.8103	0.72	0.50	74.9	2.82	2.31
0.64	37.5	43.0	2.310	71.9	0.0410	0.0339	-0.	358.	0.00125	1.7274	2.0508	0.52	0.44	74.9	1.51	1.53
1.36	37.4	43.0	1.940	85.4	0.0580	0.0473	-0.	370.	0.00120	1.2203	1.4562	0.55	0.47	74.9	1.34	1.37
2.86	36.8	42.9	1.430	115.3	0.0950	0.0776	-0.	359.	0.00124	0.7588	0.9213	0.65	0.55	74.9	1.23	1.25
4.36	35.9	42.7	1.130	146.1	0.1320	0.1069	-0.	351.	0.00127	0.5444	0.6715	0.72	0.60	74.9	1.14	1.15
5.86	34.9	42.5	0.925	178.8	0.1680	0.1358	-0.	347.	0.00129	0.4185	0.5217	0.76	0.63	74.9	1.07	1.07
7.40	33.7	42.2	0.770	214.8	0.2050	0.1658	-0.	314.	0.00144	0.3472	0.4365	0.87	0.72	74.9	1.13	1.12
8.44	32.8	42.0	0.686	240.9	0.2300	0.1863	-0.	306.	0.00146	0.3037	0.3841	0.91	0.76	74.9	1.12	1.11
9.40	31.4	41.7	0.614	269.4	0.2520	0.2044	-0.	292.	0.00157	0.2731	0.3470	0.97	0.81	74.9	1.15	1.14
10.40	30.2	41.4	0.552	299.7	0.2750	0.2238	-0.	278.	0.00166	0.2465	0.3142	1.03	0.87	74.9	1.18	1.16
11.40	28.5	40.9	0.492	336.4	0.2970	0.2434	-0.	190.	0.00262	0.2620	0.3336	1.52	1.24	74.9	1.77	1.71
12.00	27.4	40.6	0.45E	361.2	0.3110	0.2553	-0.	243.	0.00194	0.2151	0.2746	1.22	1.02	74.9	1.32	1.30
RUN 8-2001 WEIGHT FLOW, 0.1700 HEAT INPUT, 7.05 HEAT FLUX, 0.60 INLET TEMP, 42.3 OUTLET TEMP, 44.0																
0.05	57.9	42.3	4.140	77.1	-0.	0.0025	-0.	219.	0.00339	0.	34.4852	0.	0.23	126.8	0.	1.76
0.64	57.6	43.0	4.100	77.8	-0.	0.0028	-0.	453.	0.00146	0.	21.9849	0.	0.15	126.8	0.	1.07
1.36	57.2	43.5	4.050	78.7	-0.	0.0031	-0.	527.	0.00124	0.	18.5976	0.	0.14	126.8	0.	0.97
2.86	56.1	43.6	3.960	80.6	-0.	0.0035	-0.	533.	0.00122	0.	16.3630	0.	0.14	126.8	0.	0.96
4.36	54.9	46.2	3.200	99.7	0.0140	0.0172	-0.	521.	0.00126	3.7040	3.8172	0.21	0.21	126.8	0.85	0.97
5.86	53.5	46.0	2.410	132.5	0.0490	0.0405	-0.	516.	0.00127	1.4484	1.7132	0.31	0.28	126.8	0.82	0.88
7.40	51.7	45.7	1.900	168.1	0.0860	0.0644	-0.	474.	0.00140	0.9234	1.1347	0.39	0.34	126.8	0.82	0.86
8.44	50.2	45.4	1.650	193.7	0.1010	0.0805	-0.	453.	0.00146	0.7439	0.9226	0.44	0.37	126.8	0.82	0.84
9.40	48.1	45.1	1.450	219.9	0.1150	0.0952	-0.	415.	0.00162	0.6456	0.8014	0.50	0.42	126.8	0.87	0.89
10.40	46.5	44.8	1.290	247.5	0.1390	0.1103	-0.	392.	0.00172	0.5570	0.7001	0.55	0.46	126.8	0.89	0.90
11.40	44.2	44.4	1.140	279.6	0.1570	0.1255	-0.	344.	0.00199	0.5094	0.6391	0.65	0.54	126.8	1.00	1.01
12.00	42.4	44.0	1.060	301.7	0.1680	0.1339	-0.	197.	0.00390	0.6100	0.7698	1.20	0.91	126.8	2.02	1.87
RUN 9-2002 WEIGHT FLOW, 0.1360 HEAT INPUT, 7.12 HEAT FLUX, 0.60 INLET TEMP, 42.8 OUTLET TEMP, 43.0																
0.05	52.1	42.8	4.110	61.9	-0.	0.0024	-0.	230.	0.00322	0.	33.3570	0.	0.27	106.0	0.	2.08
0.64	51.6	43.7	4.060	62.6	-0.	0.0027	-0.	524.	0.00126	0.	20.0613	0.	0.17	106.0	0.	1.19
1.36	50.9	44.8	4.000	63.5	-0.	0.0029	-0.	542.	0.00121	0.	17.9990	0.	0.16	106.0	0.	1.16
2.86	49.6	45.3	2.900	87.6	0.0260	0.0231	-0.	505.	0.00131	2.5465	2.8107	0.31	0.29	106.0	1.07	1.18
4.36	48.1	45.1	2.050	123.5	0.0640	0.0527	-0.	478.	0.00139	1.1059	1.3204	0.45	0.39	106.0	1.03	1.09
5.86	46.5	44.8	1.570	162.2	0.1020	0.0818	-0.	460.	0.00145	0.7022	0.8663	0.54	0.46	106.0	0.97	1.00
7.40	44.7	44.5	1.250	204.2	0.1400	0.1114	-0.	422.	0.00160	0.5209	0.6538	0.63	0.53	106.0	0.98	1.00
8.44	43.4	44.2	1.080	234.4	0.1660	0.1331	-0.	419.	0.00161	0.4295	0.5382	0.66	0.55	106.0	0.94	0.95
9.40	41.6	43.9	0.956	265.6	0.1850	0.1507	-0.	394.	0.00172	0.3767	0.4779	0.71	0.60	106.0	0.96	0.97
10.40	40.3	43.6	0.852	298.5	0.2130	0.1701	-0.	385.	0.00177	0.3280	0.4184	0.75	0.62	106.0	0.95	0.95
11.40	38.4	43.2	0.756	336.4	0.2360	0.1893	-0.	349.	0.00199	0.2985	0.3815	0.84	0.70	106.0	1.03	1.03
12.00	37.1	43.0	0.703	361.7	0.2500	0.2034	-0.	202.	0.00378	0.3590	0.4614	1.50	1.19	106.0	1.98	1.90
RUN 10-2003 WEIGHT FLOW, 0.0940 HEAT INPUT, 7.15 HEAT FLUX, 0.61 INLET TEMP, 43.9 OUTLET TEMP, 40.6																
0.05	44.0	43.9	4.050	43.5	-0.	0.0022	-0.	258.	0.00283	0.	31.0247	0.	0.35	78.9	0.	2.63
0.64	43.6	44.3	3.260	54.1	0.0150	0.0136	-0.	535.	0.00124	3.8314	4.1487	0.34	0.34	78.9	1.42	1.61
1.36	43.2	44.2	2.410	73.0	0.0410	0.0343	-0.	530.	0.00125	1.5130	1.7718	0.51	0.46	78.9	1.37	1.48
2.86	42.2	44.0	1.550	113.6	0.0950	0.0771	-0.	483.	0.00138	0.6996	0.8530	0.70	0.60	78.9	1.27	1.31
4.36	41.1	43.8	1.130	155.9	0.1450	0.1195	-0.	452.	0.00148	0.4506	0.5625	0.82	0.69	78.9	1.20	1.22
5.86	35.6	43.5	0.876	201.3	0.2020	0.1617	-0.	455.	0.00147	0.3163	0.4014	0.86	0.73	78.9	1.08	1.09
7.40	37.6	43.1	0.657	253.1	0.2560	0.2048	-0.	440.	0.00153	0.2378	0.3068	0.93	0.78	78.9	1.04	1.04
8.44	36.1	42.8	0.605	291.6	0.2520	0.2337	-0.	435.	0.00154	0.1990	0.2596	0.95	0.80	78.9	1.01	0.99
9.40	33.8	42.2	0.525	335.9	0.3230	0.2609	-0.	423.	0.00159	0.1715	0.2237	0.99	0.84	78.9	1.00	0.99
10.40	32.1	41.6	0.462	381.9	0.3560	0.2887	-0.	420.	0.00160	0.1459	0.1930	1.01	0.85	78.9	0.98	0.96
11.40	25.3	41.1	0.397	444.4	0.3880	0.3164	-0.	386.	0.00176	0.1295	0.1711	1.11	0.94	78.9	1.04	1.02
12.00	27.4	40.6	0.360	490.3	0.4060	0.3330	-0.	217.	0.00344	0.1565	0.2070	2.01	1.69	78.9	1.98	1.94
RUN 11-2004 WEIGHT FLOW, 0.0790 HEAT INPUT, 7.17 HEAT FLUX, 0.61 INLET TEMP, 43.0 OUTLET TEMP, 39.2																
0.05	37.4	43.0	3.480	42.3	0.0050	0.0091	-0.	278.	0.00258	7.8977	7.8018	0.77	0.56	68.7	4.01	3.32
0.64	37.0	42.9	2.400	61.4	0.0370	0.0308	-0.	545.	0.00121	1.5157	1.7870	0.59	0.53	68.7	1.60	1.73
1.36	36.5	42.8	1.770	83.3	0.0670	0.0552	-0.	546.	0.00121	0.8569	1.0261	0.72	0.63	68.7	1.44	1.52
2.86	35.4	42.6	1.130	130.9	0.1310	0.1056	-0.	513.	0.00129	0.4472	0.5535	0.87	0.74	68.7	1.27	1.29
4.36	34.0	42.3	0.809	181.9	0.1940	0.1571	-0.	503.	0.00132	0.2906	0.3639	0.95	0.80	68.7	1.15	1.15
5.86	32.5	41.9	0.621	237.1	0.2570	0.2080	-0.	533.	0.00132	0.2050	0.2614	0.99	0.84	68.7	1.05	1.05
7.40	30.7	41.5	0.490	300.3	0.3200	0.2600	-0.	579.	0.00139	0.1400	0.1814	1.17	0.99	68.7	1.11	1.09
8.44	29.4	41.2	0.424	347.5	0.3620	0.2945	-0.	482.	0.00138	0.1275	0.1674	1.06	0.90	68.7	0.99	0.97
9.40	27.6	40.7	0.367	400.8	0.3990	0.3276	-0.	453.	0.00147	0.1108	0.1458	1.12	0.96	68.7	1.01	0.99
10.40	26.2	40.3	0.322	456.8	0.4350	0.3617	-0.	454.	0.00147	0.0930	0.1240	1.14	0.98	68.7	0.99	0.96
11.40	24.1	39.7	0.278	530.2	0.4770	0.3947	-0.	406.	0.00166	0.0823	0.1111	1.26	1.08	68.7	1.07	1.04
12.00	22.7	39.2	0.253	582.6	0.4950	0.4158	-0.	231.	0.00318	0.0936	0.1331	2.25	1.93	68.7	1.98	1.94
RUN 12-2204 WEIGHT FLOW, 0.1510 HEAT INPUT, 8.23 HEAT FLUX, 0.70 INLET TEMP, 45.4 OUTLET TEMP, 44.7																
0.05	65.0	45.4	3.970	71.4	-0.	0.0041	-0.	259.	0.00326	0.	21.9894	0.	0.29	115.3	0.	2.08
0.64	64.7	46.2	3.920	72.3	-0.	0.0044	-0.	531.	0.00144	0.	14.0701	0.	0.18	115.3	0.	1.24
1.36	64.4	47.2	3.860	73.4	-0.	0.0049	-0.	566.	0.00134	0.	12.4976	0.	0.18	115.3	0.	1.18
2.86	63.4	47.5	2.820	100.4	0.0340	0.0301	-0.	584.	0.00130	2.0914	2.3094	0.30	0.29	115.3	0.94	1.05
4.36	62.0	47.3	2.110	134.5	0.0760	0.0609	-0.	563.	0.00135	0.9812	1.1982	0.42	0.36	115.3	0.90	0.95
5.86	60.2	47.0	1.660	170.7	0.1170	0.0924	-0.	530.	0.00144	0.6457	0.8131	0.50	0.42	115.3	0.86	0.89
7.40	58.0	46.7	1.340	210.9	0.1590	0.1251	-0.	495.	0.00156	0.4795	0.6090	0.56	0.47	115.3	0.85	0.86
8.44	56.1	46.4	1.180	239.4	0.1860	0.1461	-0.	480.	0.00161	0.4036	0.5178	0.60	0.50	115.3	0.83	0.85
9.40	54.0	46.0	1.060	268.3	0.2110	0.1641	-0.	462.	0.00168	0.3503	0.4577	0.64	0.53	115.3	0.84	0.84
10.40	51.4	45.6	0.938	301.9	0.2360	0.1847	-0.	445.	0.00175	0.3060	0.4004	0.68	0.56	115.3	0.84	0.84
11.40	48.1	45.1	0.830	341.3	0.2590	0.2036	-0.	411.	0.00191	0.2757	0.3620	0.75	0.62	115.3	0.89	0.88
12.00	45.8	44.7	0.7													

TABLE V. - Continued. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(e) Continued. Recalculation of data from reference 12; tube inside diameter, 0.313 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

RUN 13-2005 WEIGHT FLOW, 0.1700 HEAT INPUT, 9.77 HEAT FLUX, 0.83 INLET TEMP, 42.3 OUTLET TEMP, 44.8																
0.05	66.4	42.3	4.140	80.4	-0.	0.0030	-0.	236.	0.00428	0.	30.5139	0.	0.30	131.5	0.	2.23
0.64	66.1	42.3	4.090	81.4	-0.	0.0033	-0.	594.	0.00150	0.	17.5639	0.	0.17	131.5	0.	1.18
1.36	65.6	44.4	4.020	82.7	-0.	0.0038	-0.	650.	0.00137	0.	14.5125	0.	0.16	131.5	0.	1.12
2.86	64.6	46.5	3.900	85.4	-0.	0.0045	-0.	639.	0.00140	0.	12.4930	0.	0.17	131.5	0.	1.14
4.36	63.4	47.5	3.820	106.7	0.0220	0.0210	-0.	619.	0.00145	3.0347	3.1241	0.25	0.26	131.5	0.94	1.09
5.86	61.7	47.3	2.260	147.2	0.0640	0.0524	-0.	601.	0.00150	1.1163	1.3341	0.40	0.35	131.5	0.92	0.98
7.40	59.5	46.5	1.730	191.8	0.1070	0.0853	-0.	552.	0.00164	0.6919	0.8558	0.50	0.43	131.5	0.89	0.93
8.44	57.7	46.5	1.490	224.0	0.1350	0.1062	-0.	527.	0.00172	0.5496	0.6938	0.54	0.46	131.5	0.87	0.90
9.40	55.0	46.5	1.290	257.1	0.1600	0.1267	-0.	480.	0.00191	0.4709	0.5951	0.61	0.51	131.5	0.91	0.93
10.40	52.8	45.8	1.140	292.8	0.1860	0.1459	-0.	457.	0.00202	0.4015	0.5161	0.66	0.55	131.5	0.92	0.93
11.40	45.4	45.5	0.992	335.4	0.2110	0.1660	-0.	408.	0.00228	0.3568	0.4611	0.75	0.63	131.5	0.99	1.00
12.00	46.7	44.8	0.908	366.5	0.2250	0.1776	-0.	189.	0.00576	0.4718	0.6104	1.72	1.31	131.5	2.57	2.40
RUN 14-2006 WEIGHT FLOW, 0.1520 HEAT INPUT, 9.93 HEAT FLUX, 0.84 INLET TEMP, 43.0 OUTLET TEMP, 43.0																
0.05	57.5	43.0	4.100	60.5	-0.	0.0028	-0.	250.	0.00406	0.	29.6236	0.	0.37	103.5	0.	2.79
0.64	57.6	44.3	4.030	61.5	-0.	0.0032	-0.	631.	0.00143	0.	16.3720	0.	0.21	103.5	0.	1.48
1.36	56.5	45.8	3.950	62.6	-0.	0.0036	-0.	653.	0.00138	0.	14.4105	0.	0.21	103.5	0.	1.44
2.86	55.7	46.3	2.550	97.1	0.0430	0.0364	-0.	605.	0.00150	1.5390	1.7767	0.45	0.42	103.5	1.23	1.35
4.36	54.5	46.1	1.730	143.2	0.0990	0.0792	-0.	566.	0.00162	0.7033	0.8673	0.64	0.55	103.5	1.15	1.20
5.86	52.6	45.8	1.290	191.7	0.1540	0.1221	-0.	548.	0.00168	0.4468	0.5634	0.73	0.62	103.5	1.06	1.08
7.40	50.1	45.4	1.010	246.1	0.2100	0.1641	-0.	509.	0.00182	0.3223	0.4193	0.81	0.68	103.5	1.03	1.03
8.44	48.2	45.1	0.866	286.2	0.2460	0.1935	-0.	508.	0.00182	0.2630	0.3436	0.84	0.70	103.5	0.98	0.97
9.40	45.4	44.6	0.750	330.2	0.2790	0.2198	-0.	480.	0.00193	0.2252	0.2972	0.89	0.74	103.5	0.99	0.98
10.40	43.3	44.2	0.658	376.6	0.3130	0.2472	-0.	477.	0.00194	0.1903	0.2536	0.92	0.76	103.5	0.96	0.94
11.40	35.5	43.5	0.568	436.3	0.3440	0.2742	-0.	433.	0.00216	0.1693	0.2258	1.01	0.85	103.5	1.02	1.00
12.00	37.4	43.0	0.516	480.8	0.3630	0.2897	-0.	198.	0.00543	0.2248	0.3019	2.25	1.82	103.5	2.49	2.40
RUN 15-2007 WEIGHT FLOW, 0.0930 HEAT INPUT, 9.93 HEAT FLUX, 0.84 INLET TEMP, 44.0 OUTLET TEMP, 40.8																
0.05	45.3	44.0	4.050	42.5	-0.	0.0025	-0.	268.	0.00376	0.	29.1121	0.	0.48	78.2	0.	3.59
0.64	49.0	45.2	3.530	49.1	0.0090	0.0097	-0.	653.	0.00138	5.8285	5.3774	0.32	0.37	78.2	1.55	1.93
1.36	48.5	45.1	2.380	73.0	0.0460	0.0388	-0.	654.	0.00138	1.2898	1.5011	0.63	0.57	78.2	1.56	1.70
2.86	47.4	45.0	1.400	124.2	0.1250	0.0991	-0.	578.	0.00158	0.5121	0.6423	0.92	0.78	78.2	1.43	1.47
4.36	46.1	44.7	0.976	177.7	0.2020	0.1601	-0.	542.	0.00169	0.3120	0.3995	1.05	0.88	78.2	1.31	1.32
5.86	44.3	44.4	0.737	235.4	0.2780	0.2199	-0.	560.	0.00163	0.2061	0.2706	1.09	0.91	78.2	1.17	1.16
7.40	41.8	43.9	0.575	301.8	0.3550	0.2810	-0.	546.	0.00168	0.1469	0.1985	1.15	0.96	78.2	1.12	1.09
8.44	35.4	43.5	0.493	351.9	0.4050	0.3223	-0.	555.	0.00164	0.1174	0.1610	1.16	0.97	78.2	1.06	1.03
9.40	36.4	42.9	0.422	411.6	0.4450	0.3589	-0.	525.	0.00174	0.0988	0.1377	1.21	1.01	78.2	1.06	1.03
10.40	34.8	42.5	0.367	473.0	0.4960	0.3978	-0.	527.	0.00174	0.0808	0.1150	1.23	1.03	78.2	1.04	1.00
11.40	31.1	41.6	0.309	562.2	0.5390	0.4365	-0.	477.	0.00193	0.0688	0.0992	1.32	1.12	78.2	1.09	1.05
12.00	28.1	40.8	0.272	638.5	0.5630	0.4599	-0.	212.	0.00493	0.0907	0.1311	2.93	2.47	78.2	2.54	2.48
RUN 16-2008 WEIGHT FLOW, 0.0780 HEAT INPUT, 9.89 HEAT FLUX, 0.84 INLET TEMP, 43.9 OUTLET TEMP, 39.4																
0.05	41.5	43.5	3.510	41.7	0.0050	0.0091	-0.	289.	0.00342	8.1634	7.5900	0.58	0.74	68.0	5.18	4.40
0.64	41.1	43.0	2.220	65.9	0.0480	0.0396	-0.	679.	0.00132	1.1144	1.3269	0.77	0.69	68.0	1.77	1.91
1.36	40.5	42.7	1.560	93.7	0.0910	0.0737	-0.	681.	0.00131	0.5956	0.7271	0.94	0.81	68.0	1.57	1.63
2.86	35.2	43.4	0.949	154.0	0.1810	0.1448	-0.	609.	0.00148	0.3049	0.3848	1.16	0.98	68.0	1.43	1.43
4.36	37.7	43.1	0.665	218.4	0.2650	0.2156	-0.	583.	0.00155	0.1933	0.2498	1.25	1.06	68.0	1.31	1.30
5.86	36.1	42.8	0.508	287.9	0.3570	0.2857	-0.	604.	0.00149	0.1282	0.1712	1.27	1.07	68.0	1.19	1.16
7.40	33.9	42.3	0.356	369.1	0.4450	0.3579	-0.	591.	0.00153	0.0901	0.1244	1.32	1.12	68.0	1.15	1.10
8.44	32.2	41.9	0.335	431.5	0.5030	0.4063	-0.	622.	0.00144	0.0693	0.0981	1.30	1.10	68.0	1.08	1.03
9.40	29.8	41.9	0.289	504.9	0.5550	0.4522	-0.	588.	0.00153	0.0569	0.0822	1.35	1.15	68.0	1.09	1.04
10.40	27.5	40.8	0.250	583.3	0.6050	0.4994	-0.	595.	0.00151	0.0448	0.0666	1.36	1.16	68.0	1.06	1.02
11.40	25.3	40.0	0.213	686.7	0.6610	0.5459	-0.	544.	0.00166	0.0365	0.0563	1.43	1.23	68.0	1.10	1.05
12.00	25.2	39.4	0.189	772.6	0.6910	0.5750	-0.	237.	0.00425	0.0475	0.0745	3.08	2.65	68.0	2.42	2.36

TABLE V. - Concluded. UNIFORMLY HEATED SUBCRITICAL PRESSURE RUNS

(e) Concluded. Recalculation of data from reference 12; tube inside diameter, 0.313 inch; tube outside diameter, 0.375 inch; heated tube length, 24 inches

RUN 17-2201 WEIGHT FLOW, 0.1420 HEAT INPUT, 10.93 HEAT FLUX, 0.93 INLET TEMP, 45.0 OUTLET TEMP, 45.3																
0.05	71.1	45.0	3.550	66.6	-0.	0.0044	-0.	254.	0.00444	0.	21.6027	0.	0.40	109.8	0.	2.93
0.64	70.7	46.2	3.920	67.7	-0.	0.0049	-0.	686.	0.00145	0.	11.6675	0.	0.22	109.8	0.	1.44
1.36	70.2	47.5	3.840	69.3	-0.	0.0055	-0.	714.	0.00139	0.	10.3237	0.	0.22	109.8	0.	1.39
2.86	68.7	48.3	2.680	59.0	0.0430	0.0371	-0.	682.	0.00146	1.6123	1.8221	0.40	0.38	109.8	1.13	1.25
4.36	67.0	46.0	1.880	141.1	0.1040	0.0810	-0.	647.	0.00154	0.6966	0.8786	0.59	0.50	109.8	1.06	1.11
5.86	64.9	47.8	1.430	185.5	0.1630	0.1243	-0.	605.	0.00166	0.4454	0.5837	0.70	0.58	109.8	1.01	1.03
7.40	62.2	47.4	1.120	236.2	0.2230	0.1708	-0.	578.	0.00175	0.3149	0.4188	0.77	0.64	109.8	0.97	0.97
8.44	60.0	47.0	0.970	273.7	0.2620	0.2012	-0.	564.	0.00179	0.2584	0.3474	0.81	0.66	109.8	0.94	0.93
9.40	57.8	46.7	0.854	311.0	0.2970	0.2293	-0.	548.	0.00184	0.2199	0.2978	0.84	0.69	109.8	0.91	0.90
10.40	55.1	46.2	0.753	352.7	0.3330	0.2579	-0.	535.	0.00190	0.1870	0.2562	0.87	0.72	109.8	0.90	0.89
11.40	51.7	45.7	0.662	401.3	0.3670	0.2850	-0.	491.	0.00208	0.1654	0.2294	0.93	0.76	109.8	0.93	0.91
12.00	45.4	45.3	0.611	434.7	0.3870	0.3015	-0.	263.	0.00425	0.2055	0.2866	1.73	1.40	105.8	1.85	1.81
RUN 18-2202 WEIGHT FLOW, 0.1010 HEAT INPUT, 10.95 HEAT FLUX, 0.93 INLET TEMP, 45.5 OUTLET TEMP, 43.0																
0.05	55.3	45.5	3.960	47.9	-0.	0.0037	-0.	260.	0.00432	0.	22.5380	0.	0.52	83.6	0.	3.82
0.64	58.7	46.3	3.640	52.2	0.0060	0.0085	-0.	689.	0.00145	8.9933	6.4683	0.26	0.34	83.6	1.41	1.88
1.36	58.2	46.7	2.530	75.1	0.0450	0.0384	-0.	693.	0.00144	1.4035	1.6079	0.58	0.54	83.6	1.50	1.65
2.86	56.7	46.5	1.530	124.1	0.1270	0.1003	-0.	652.	0.00153	0.5187	0.6514	0.85	0.72	83.6	1.33	1.37
4.36	54.8	46.2	1.030	175.8	0.2070	0.1617	-0.	619.	0.00162	0.3094	0.4017	0.99	0.82	83.6	1.22	1.23
5.86	52.5	45.8	0.820	231.5	0.2860	0.2228	-0.	609.	0.00165	0.2076	0.2776	1.06	0.88	83.6	1.14	1.12
7.40	44.0	45.4	0.645	294.2	0.3650	0.2846	-0.	604.	0.00166	0.1466	0.2022	1.10	0.91	83.6	1.07	1.04
8.44	47.6	45.0	0.550	341.5	0.4170	0.3258	-0.	598.	0.00168	0.1183	0.1668	1.13	0.93	83.6	1.04	1.00
9.40	45.4	44.6	0.487	389.6	0.4640	0.3641	-0.	587.	0.00171	0.0982	0.1412	1.16	0.96	83.6	1.02	0.98
10.40	42.6	44.1	0.424	447.8	0.5110	0.4027	-0.	575.	0.00175	0.0810	0.1193	1.19	0.99	83.6	1.01	0.97
11.40	35.3	43.4	0.367	517.7	0.5560	0.4416	-0.	520.	0.00195	0.0697	0.1047	1.26	1.05	83.6	1.04	1.00
12.00	37.1	43.0	0.335	567.3	0.5820	0.4638	-0.	267.	0.00415	0.0867	0.1322	2.36	1.96	83.6	2.03	1.97
RUN 19-2203 WEIGHT FLOW, 0.0680 HEAT INPUT, 10.94 HEAT FLUX, 0.93 INLET TEMP, 45.2 OUTLET TEMP, 41.2																
0.05	48.7	45.2	3.200	40.0	0.0170	0.0159	-0.	295.	0.00371	4.9119	5.1780	1.33	1.03	60.9	6.04	5.35
0.64	48.3	45.1	2.010	63.5	0.0670	0.0549	-0.	742.	0.00133	0.3404	1.0070	0.97	0.86	60.9	1.92	2.04
1.36	47.0	45.0	1.410	90.4	0.1230	0.0989	-0.	732.	0.00135	0.4608	0.5695	1.17	1.00	60.9	1.72	1.77
2.86	46.5	44.8	0.862	148.4	0.2400	0.1888	-0.	675.	0.00147	0.2285	0.2981	1.37	1.15	60.9	1.52	1.51
4.36	44.9	44.5	0.609	210.0	0.3550	0.2791	-0.	678.	0.00146	0.1358	0.1849	1.45	1.20	60.9	1.37	1.33
5.86	43.0	44.2	0.462	276.6	0.4680	0.3686	-0.	681.	0.00146	0.0869	0.1247	1.50	1.25	60.9	1.29	1.23
7.40	40.6	43.7	0.362	353.0	0.5810	0.4603	-0.	678.	0.00146	0.0562	0.0864	1.53	1.27	60.9	1.23	1.16
8.44	38.7	43.3	0.311	411.4	0.6560	0.5214	-0.	676.	0.00146	0.0412	0.0677	1.54	1.29	60.9	1.20	1.13
9.40	36.6	42.9	0.270	472.9	0.7240	0.5782	-0.	675.	0.00147	0.0301	0.0536	1.57	1.31	60.9	1.18	1.11
10.40	34.3	42.4	0.234	545.4	0.7920	0.6371	-0.	660.	0.00150	0.0210	0.0420	1.59	1.34	60.9	1.17	1.11
11.40	31.5	41.7	0.202	634.8	0.8590	0.6929	-0.	602.	0.00166	0.0139	0.0338	1.68	1.42	60.9	1.22	1.14
12.00	25.6	41.2	0.183	695.6	0.8970	0.7296	-0.	302.	0.00356	0.0140	0.0399	2.92	2.48	60.9	2.12	2.04
RUN 20-2009 WEIGHT FLOW, 0.1660 HEAT INPUT, 11.91 HEAT FLUX, 1.01 INLET TEMP, 43.1 OUTLET TEMP, 45.1																
0.05	72.3	43.1	4.090	75.9	-0.	0.0038	-0.	250.	0.00489	0.	25.0591	0.	0.38	124.4	0.	2.79
0.64	71.9	44.3	4.330	77.1	-0.	0.0041	-0.	671.	0.00161	0.	13.3938	0.	0.21	124.4	0.	1.40
1.36	71.3	45.7	3.950	78.6	-0.	0.0047	-0.	732.	0.00147	0.	11.7459	0.	0.20	124.4	0.	1.32
2.86	70.1	46.5	3.780	82.1	-0.	0.0061	-0.	689.	0.00157	0.	9.6352	0.	0.22	124.4	0.	1.37
4.36	68.5	46.3	2.470	126.0	0.0560	0.0460	-0.	661.	0.00165	1.2753	1.5117	0.44	0.40	124.4	1.09	1.19
5.86	66.4	46.0	1.800	172.7	0.1120	0.0868	-0.	641.	0.00170	0.6466	0.8216	0.58	0.49	124.4	1.01	1.05
7.40	63.7	47.0	1.380	224.7	0.1690	0.1293	-0.	590.	0.00186	0.4301	0.5630	0.69	0.57	124.4	0.99	1.00
8.44	61.6	47.3	1.180	263.1	0.2060	0.1577	-0.	587.	0.00187	0.3402	0.4504	0.73	0.60	124.4	0.94	0.94
9.40	58.3	46.8	1.020	305.5	0.2380	0.1836	-0.	514.	0.00216	0.3000	0.3983	0.80	0.66	124.4	0.98	0.98
10.40	55.8	46.4	0.892	348.3	0.2720	0.2106	-0.	497.	0.00224	0.2541	0.3400	0.84	0.69	124.4	0.97	0.96
11.40	51.7	45.7	0.773	401.7	0.3090	0.2364	-0.	436.	0.00258	0.2280	0.3063	0.94	0.79	124.4	1.06	1.05
12.00	46.3	45.1	0.702	442.7	0.3210	0.2510	-0.	191.	0.00694	0.3079	0.4159	2.27	1.76	124.4	2.81	2.68

TABLE VI. - AXIAL HEAT-FLUX-

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	RJFM
RUN 1- 772 WEIGHT FLOW, 0.1114 HEAT INPUT, 9.98 INLET BULK TEMP, 49.2 OUTLET BULK TEMP, 66.8 PLJ1 C4 2															
3.00	366.0	52.7	3.907	77.3	0.025	0.0214	239.	135.	0.00638	1.89	1.05	1.97	2.57	0.187	3.79
4.00	365.7	53.9	3.837	78.7	0.026	0.0249	245.	140.	0.00725	2.24	1.15	2.34	2.59	0.166	3.69
5.00	365.5	55.3	3.752	80.5	0.027	0.0295	267.	161.	0.00717	2.63	1.17	2.78	2.92	0.122	3.51
5.75	365.1	56.4	3.676	82.2	0.029	0.0340	278.	170.	0.00760	2.89	1.22	3.08	3.01	0.104	3.38
6.50	364.4	57.7	3.584	84.3	0.030	0.0401	355.	250.	0.00547	2.59	1.03	2.93	4.33	0.055	3.00
7.25	363.4	59.0	3.475	86.9	0.033	0.0480	406.	304.	0.00481	2.31	0.95	2.74	5.15	0.037	2.68
8.00	361.8	60.7	3.324	90.9	0.036	0.0606	1027.	914.	0.00216	0.99	0.71	2.26	15.07	0.009	1.45
8.75	360.7	62.3	3.157	95.7	0.041	0.0767	661.	559.	0.00287	1.24	0.66	1.98	8.99	0.012	1.65
9.50	360.8	63.4	3.024	99.9	0.045	0.0917	499.	401.	0.00351	1.47	0.63	1.98	6.33	0.014	1.77
10.25	361.1	64.3	2.909	103.9	0.049	0.1060	505.	409.	0.00304	1.23	0.53	1.68	6.35	0.011	1.62
11.00	361.1	65.0	2.809	107.6	0.052	0.1196	447.	352.	0.00311	1.23	0.48	1.58	5.41	0.010	1.63
12.00	360.9	65.8	2.697	112.0	0.057	0.1364	428.	335.	0.00273	1.04	0.39	1.32	5.09	0.008	1.55
RUN 2- 773 WEIGHT FLOW, 0.1189 HEAT INPUT, 10.13 INLET BULK TEMP, 48.2 OUTLET BULK TEMP, 67.6 PLJ1 CH 3															
3.00	384.8	51.8	3.978	81.1	0.025	0.0190	242.	121.	0.00786	1.74	1.20	1.79	2.34	0.249	3.72
4.00	384.4	53.0	3.912	82.4	0.026	0.0220	246.	122.	0.00928	2.09	1.36	2.16	2.30	0.232	3.85
5.00	383.9	54.4	3.832	84.2	0.027	0.0261	264.	143.	0.00886	2.54	1.35	2.65	2.63	0.166	3.68
5.75	383.3	55.5	3.760	85.8	0.029	0.0302	273.	151.	0.00930	2.85	1.39	2.99	2.72	0.141	3.56
6.50	382.8	56.8	3.674	87.8	0.030	0.0356	350.	231.	0.00623	2.67	1.12	2.96	4.07	0.070	3.17
7.25	382.2	58.2	3.574	90.2	0.033	0.0425	364.	245.	0.00629	2.70	1.10	3.03	4.22	0.057	3.00
8.00	381.6	59.8	3.446	93.6	0.036	0.0525	740.	625.	0.00290	1.29	0.79	2.09	10.45	0.016	1.99
8.75	381.3	61.4	3.301	97.7	0.039	0.0656	695.	581.	0.00295	1.25	0.71	1.96	9.45	0.014	1.83
9.50	381.4	62.7	3.173	101.6	0.043	0.0788	486.	376.	0.00391	1.58	0.70	2.02	6.00	0.020	2.04
10.25	381.6	63.7	3.065	105.2	0.046	0.0912	481.	373.	0.00348	1.36	0.59	1.74	5.85	0.017	1.90
11.00	381.5	64.5	2.972	108.5	0.049	0.1028	417.	308.	0.00372	1.42	0.54	1.72	4.77	0.018	1.95
12.00	381.1	65.3	2.866	112.5	0.053	0.1170	409.	303.	0.00317	1.17	0.44	1.42	4.63	0.015	1.84
RUN 3- 774 WEIGHT FLOW, 0.0990 HEAT INPUT, 9.80 INLET BULK TEMP, 49.8 OUTLET BULK TEMP, 68.9 PLJ1 CH 4															
3.00	355.6	53.5	3.849	69.8	0.023	0.0237	237.	137.	0.00613	2.09	1.07	2.18	2.55	0.171	3.71
4.00	355.2	54.8	3.772	71.2	0.024	0.0277	244.	143.	0.00683	2.46	1.16	2.58	2.61	0.147	3.60
5.00	354.8	56.2	3.677	73.0	0.026	0.0331	271.	168.	0.00660	2.81	1.16	3.00	2.99	0.103	3.39
5.75	354.4	57.3	3.592	74.8	0.027	0.0386	289.	185.	0.00661	3.00	1.16	3.24	3.22	0.091	3.22
6.50	354.0	58.6	3.487	77.0	0.029	0.0461	417.	320.	0.00411	2.22	0.92	2.68	5.45	0.035	2.65
7.25	353.6	60.1	3.357	80.0	0.032	0.0564	511.	416.	0.00348	1.80	0.84	2.41	6.92	0.021	2.21
8.00	353.2	61.8	3.180	84.4	0.036	0.0729	1114.	1000.	0.00198	0.93	0.70	2.40	16.17	0.006	1.19
8.75	352.8	63.4	2.993	89.7	0.041	0.0934	628.	530.	0.00289	1.31	0.66	2.07	8.36	0.009	1.49
9.50	352.4	64.5	2.846	94.4	0.045	0.1121	514.	420.	0.00326	1.43	0.61	2.00	6.51	0.009	1.52
10.25	352.0	65.3	2.717	98.8	0.050	0.1304	509.	416.	0.00289	1.22	0.51	1.71	6.38	0.006	1.39
11.00	351.6	66.0	2.605	103.1	0.054	0.1480	459.	367.	0.00289	1.19	0.45	1.57	5.57	0.005	1.38
12.00	351.2	66.7	2.481	108.2	0.059	0.1696	426.	336.	0.00263	1.05	0.37	1.35	5.04	0.003	1.33
RUN 4- 775 WEIGHT FLOW, 0.1501 HEAT INPUT, 13.45 INLET BULK TEMP, 46.2 OUTLET BULK TEMP, 67.9 PLJ1 CH 5															
3.00	391.0	50.0	4.076	99.9	0.030	0.0150	280.	132.	0.00833	1.74	1.18	1.80	2.65	0.235	4.00
4.00	390.7	51.2	4.011	101.5	0.031	0.0177	285.	133.	0.00982	2.08	1.34	2.16	2.60	0.220	3.92
5.00	390.3	52.7	3.933	103.5	0.032	0.0213	305.	154.	0.00978	2.53	1.37	2.65	2.91	0.164	3.77
5.75	389.8	54.0	3.863	105.4	0.034	0.0248	314.	161.	0.01042	2.85	1.43	3.00	2.99	0.143	3.66
6.50	388.9	55.3	3.779	107.7	0.036	0.0294	385.	235.	0.00758	2.74	1.22	3.02	4.24	0.077	3.34
7.25	387.9	56.8	3.680	110.6	0.038	0.0356	428.	280.	0.00680	2.54	1.13	2.90	4.93	0.055	3.07
8.00	386.7	58.8	3.537	115.1	0.042	0.0458	1124.	957.	0.00281	1.08	0.85	2.39	16.28	0.012	1.75
8.75	385.6	60.8	3.369	120.8	0.047	0.0598	875.	726.	0.00318	1.15	0.75	2.07	11.95	0.012	1.73
9.50	385.3	62.2	3.234	125.9	0.052	0.0729	545.	404.	0.00458	1.55	0.73	2.03	6.50	0.020	2.06
10.25	385.4	63.3	3.126	130.2	0.056	0.0848	544.	406.	0.00402	1.32	0.61	1.74	6.42	0.017	1.91
11.00	385.2	64.1	3.031	134.3	0.059	0.0961	487.	351.	0.00409	1.31	0.55	1.64	5.48	0.017	1.91
12.00	384.9	65.0	2.924	139.2	0.064	0.1100	466.	333.	0.00359	1.11	0.44	1.38	5.13	0.015	1.82
RUN 5- 776 WEIGHT FLOW, 0.1234 HEAT INPUT, 6.94 INLET BULK TEMP, 56.5 OUTLET BULK TEMP, 67.7 PLJ1 CH 6															
3.00	407.3	58.6	3.588	93.3	0.033	0.0437	209.	116.	0.00737	1.38	0.83	1.42	1.98	0.201	3.53
4.00	407.0	59.3	3.536	94.7	0.034	0.0478	216.	123.	0.00784	1.61	0.89	1.67	2.07	0.170	3.44
5.00	406.5	60.1	3.473	96.4	0.036	0.0531	233.	142.	0.00743	1.86	0.88	1.95	2.36	0.122	3.26
5.75	405.8	60.7	3.416	98.0	0.037	0.0581	246.	156.	0.00726	2.02	0.88	2.14	2.57	0.097	3.13
6.50	404.8	61.5	3.349	99.9	0.039	0.0643	287.	195.	0.00608	2.02	0.81	2.20	3.18	0.063	2.86
7.25	403.7	62.3	3.274	102.2	0.041	0.0717	273.	180.	0.00731	2.26	0.89	2.43	2.89	0.064	2.83
8.00	402.5	63.1	3.194	104.8	0.043	0.0802	309.	218.	0.00598	2.07	0.78	2.29	3.45	0.044	2.56
8.75	401.4	63.9	3.112	107.6	0.046	0.0895	275.	182.	0.00731	2.21	0.83	2.39	2.85	0.050	2.62
9.50	400.7	64.5	3.036	110.3	0.048	0.0988	285.	193.	0.00631	1.96	0.71	2.14	3.00	0.040	2.47
10.25	400.5	65.1	2.968	112.8	0.051	0.1077	282.	192.	0.00564	1.71	0.62	1.87	2.94	0.036	2.39
11.00	400.7	65.7	2.908	115.1	0.053	0.1160	264.	174.	0.00575	1.61	0.58	1.73	2.66	0.038	2.41
12.00	401.0	66.2	2.841	117.8	0.055	0.1259	249.	163.	0.00534	1.39	0.51	1.49	2.46	0.037	2.40
RUN 6- 777 WEIGHT FLOW, 0.1032 HEAT INPUT, 6.75 INLET BULK TEMP, 57.3 OUTLET BULK TEMP, 69.1 PLJ1 CH 7															
3.00	408.8	59.6	3.516	79.6	0.029	0.0497	218.	137.	0.00519	1.44	0.72	1.50	2.31	0.136	3.34
4.00	408.6	60.3	3.455	81.0	0.030	0.0549	242.	162.	0.00475	1.59	0.69	1.68	2.69	0.096	3.14
5.00	408.4	61.2	3.381	82.8	0.032	0.0617	280.	198.	0.00438	1.70	0.69	1.84	3.24	0.065	2.89
5.75	408.1	62.0	3.314	84.5	0.033	0.0682	280.	196.	0.00503	1.90	0.76	2.07	3.16	0.061	2.81
6.50	407.8	62.8	3.238	86.4	0.035	0.0762	296.	211.	0.00522	2.05	0.79	2.25	3.37	0.049	2.65
7.25	407.5	63.6	3.153	88.8	0.037	0.0858	286.	201.	0.00602	2.24	0.85	2.45	3.15	0.047	2.58
8.00	407.3	64.5	3.060	91.5	0.040	0.0970	366.	285.	0.00417	1.73	0.68	2.02	4.41	0.025	2.15
8.75	407.0	65.4	2.965	94.4	0.042	0.1096	343.	261.	0.00443	1.76	0.66	2.02	4.00	0.024	2.10
9.50	406.7	66.1	2.877	97.3	0.045	0.1221	304.	220.	0.00508	1.86	0.67	2.08	3.33	0.025	2.16
10.25	406.3	66.8	2.798	100.0	0.047	0.1339	298.	216.	0.00460	1.64	0.58	1.82	3.23	0.022	2.08
11.00	405.7	67.3	2.729	102.6	0.050	0.1449	281.	199.	0.00455	1.52	0.54	1.67	2.96	0.020	2.08
12.00	405.1	67.9	2.651	105.6	0.052	0.1583	281.	202.	0.00376	1.23	0.43	1.36	2.97	0.016	1.98

GRADIENT (SUPERCRITICAL) RUNS

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DQDL	H/H-H	SIMPLE	NU/NT	TDLK
HEAT BALANCE, 0.02 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.177 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1033295.	746344.	3215902.	1.220	0.632	16.2413	2.886	0.2846	0.3524	0.00509	0.53	0.644	129.5	0.40	1.76
1082022.	716458.	3158641.	1.230	0.619	13.8215	3.120	0.2940	0.3455	0.00606	0.62	0.717	128.9	0.47	1.74
1143833.	586261.	2922078.	1.245	0.592	10.7780	4.078	0.3059	0.3243	0.00766	0.76	0.719	121.5	0.52	1.70
1201599.	550329.	2810380.	1.261	0.590	9.1222	4.568	0.3169	0.3209	0.00870	0.86	0.770	119.6	0.58	1.67
1274192.	322473.	2130919.	1.284	0.621	6.3625	8.959	0.3307	0.3223	0.01070	1.05	0.743	99.7	0.52	1.64
1365049.	248572.	1765334.	1.315	0.647	4.8338	12.924	0.3478	0.3430	0.01161	1.18	0.767	91.5	0.52	1.65
1498964.	47936.	507269.	1.368	0.691	2.1820	87.919	0.3727	0.4046	0.01389	1.84	0.708	53.5	0.40	2.51
1656205.	108826.	840739.	1.437	0.682	2.2345	40.751	0.4012	0.4116	0.01135	1.43	0.670	69.2	0.44	2.06
1788399.	185536.	1143723.	1.494	0.674	2.2140	23.737	0.4240	0.3844	0.01000	1.18	0.657	82.5	0.49	1.77
1905557.	187437.	1071910.	1.543	0.675	1.8936	25.163	0.4430	0.3869	0.00853	1.05	0.573	82.3	0.45	1.78
2010583.	240625.	1218049.	1.589	0.665	1.8002	19.796	0.4596	0.3674	0.00739	0.89	0.529	89.2	0.45	1.65
2130557.	267846.	1236816.	1.655	0.661	1.6062	18.574	0.4790	0.3601	0.00598	0.73	0.447	92.0	0.40	1.60
HEAT BALANCE, -0.09 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.179 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1050000.	982965.	3505561.	1.211	0.717	20.3453	2.245	0.2752	0.3848	0.00448	0.55	0.794	142.9	0.43	1.80
1097534.	971960.	3493071.	1.216	0.701	17.4956	2.337	0.2837	0.3801	0.00532	0.64	0.906	144.0	0.52	1.78
1157390.	771931.	3305514.	1.227	0.617	13.3521	3.096	0.2944	0.3463	0.00689	0.78	0.839	134.9	0.56	1.74
1213017.	716826.	3202320.	1.238	0.602	11.2378	3.485	0.3044	0.3367	0.00791	0.89	0.872	132.6	0.62	1.71
1282379.	394748.	2450222.	1.255	0.607	7.6119	7.259	0.3167	0.3187	0.01007	1.09	0.754	108.4	0.52	1.67
1367210.	368458.	2289552.	1.278	0.616	6.2139	8.339	0.3316	0.3235	0.01077	1.18	0.794	106.4	0.56	1.64
1480776.	95494.	926679.	1.311	0.681	3.1461	42.397	0.3511	0.4157	0.01211	1.54	0.706	67.6	0.40	2.12
1618810.	110963.	927931.	1.357	0.681	2.6320	39.292	0.3744	0.4134	0.01115	1.53	0.674	71.1	0.41	2.08
1746743.	219311.	1385375.	1.400	0.668	2.7420	19.285	0.3953	0.3778	0.00973	1.22	0.668	89.3	0.48	1.73
1858523.	229198.	1341757.	1.438	0.668	2.3815	19.520	0.4126	0.3771	0.00834	1.07	0.585	90.4	0.44	1.72
1958735.	310136.	1577682.	1.469	0.648	2.3184	14.502	0.4274	0.3491	0.00721	0.91	0.544	100.1	0.46	1.58
2074124.	327801.	1552514.	1.506	0.647	2.0449	14.413	0.4435	0.3472	0.00586	0.75	0.456	101.6	0.40	1.55
HEAT BALANCE, -0.12 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.239 ID, 0.260 OD, 0.370 LENGTH, 16.0														
954528.	641357.	2852449.	1.230	0.623	14.4499	3.076	0.2924	0.3467	0.00570	0.51	0.664	118.2	0.43	1.74
1004156.	604491.	2777994.	1.244	0.609	12.1006	3.411	0.3033	0.3380	0.00682	0.60	0.727	116.9	0.51	1.71
1067736.	484135.	2523192.	1.265	0.591	9.2723	4.614	0.3171	0.3191	0.00850	0.74	0.730	109.2	0.55	1.67
1127766.	428794.	2349088.	1.287	0.594	7.6054	5.570	0.3300	0.3153	0.00984	0.84	0.766	105.2	0.59	1.63
1205281.	199707.	1508303.	1.318	0.654	4.8378	14.402	0.3465	0.3492	0.01209	1.07	0.753	80.9	0.49	1.67
1305988.	140075.	1125693.	1.364	0.676	3.4791	29.217	0.3678	0.3873	0.01283	1.24	0.758	71.8	0.49	1.80
1453101.	37729.	365247.	1.438	0.686	1.7145	109.212	0.3984	0.4043	0.01541	1.86	0.748	46.9	0.45	2.68
1618566.	107922.	733495.	1.526	0.683	1.8634	39.718	0.4312	0.4098	0.01197	1.35	0.710	65.3	0.50	2.03
1752262.	159925.	901174.	1.599	0.677	1.7400	27.527	0.4567	0.3898	0.01059	1.16	0.687	74.0	0.54	1.80
1877593.	168612.	863967.	1.680	0.677	1.4903	27.749	0.4798	0.3891	0.00899	1.02	0.604	74.8	0.50	1.80
1985563.	210464.	960001.	1.772	0.670	1.3857	22.509	0.5015	0.3740	0.00777	0.87	0.555	80.0	0.49	1.68
2106386.	250456.	1021743.	1.872	0.662	1.2469	19.596	0.5241	0.3600	0.00625	0.71	0.476	84.1	0.45	1.58
HEAT BALANCE, -0.13 TEST VOLTAGE, 10.8 HEAT INPUT/UNIT AREA, 1.517 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1239556.	1094087.	4346247.	1.209	0.666	24.0009	2.439	0.2633	0.3683	0.00455	0.69	0.722	161.8	0.39	1.82
1295723.	1081972.	4319077.	1.209	0.656	20.4309	2.541	0.2711	0.3646	0.00539	0.81	0.826	163.2	0.47	1.80
1366022.	879612.	4075094.	1.214	0.604	15.6682	3.295	0.2810	0.3383	0.00691	0.99	0.805	154.3	0.52	1.77
1431108.	824373.	3953833.	1.221	0.594	13.1612	3.670	0.2902	0.3307	0.00792	1.12	0.851	152.4	0.58	1.74
1512275.	484445.	3127738.	1.234	0.607	9.0955	7.061	0.3017	0.3202	0.00998	1.36	0.784	127.8	0.51	1.70
1612794.	381848.	2690448.	1.252	0.632	6.9306	9.844	0.3158	0.3357	0.01091	1.52	0.810	118.7	0.51	1.69
1766049.	60477.	752792.	1.285	0.688	2.8862	82.684	0.3369	0.4047	0.01395	2.53	0.765	65.3	0.39	2.48
1959741.	98684.	946493.	1.331	0.677	2.5799	55.283	0.3630	0.4150	0.01170	2.12	0.697	76.2	0.40	2.27
2125540.	247052.	1665446.	1.374	0.673	2.8700	21.292	0.3847	0.3865	0.00970	1.57	0.684	103.3	0.47	1.79
2264950.	253193.	1586691.	1.411	0.673	2.4657	22.096	0.4022	0.3873	0.00831	1.38	0.596	104.0	0.43	1.79
2391145.	321441.	1778710.	1.442	0.662	2.3371	17.636	0.4173	0.3685	0.00720	1.17	0.546	112.6	0.43	1.67
2536726.	357322.	1807640.	1.477	0.657	2.0893	16.570	0.4338	0.3610	0.00584	0.96	0.460	116.3	0.38	1.62
HEAT BALANCE, -0.08 TEST VOLTAGE, 7.2 HEAT INPUT/UNIT AREA, 0.862 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1403450.	1170216.	3562822.	1.263	0.729	9.6327	2.317	0.3284	0.3884	0.00317	0.42	0.625	160.2	0.42	1.69
1450366.	1080941.	3501721.	1.274	0.679	8.4607	2.581	0.3361	0.3734	0.00382	0.50	0.655	156.5	0.47	1.67
1508920.	889492.	3286570.	1.289	0.615	6.9689	3.306	0.3455	0.3467	0.00482	0.61	0.630	146.7	0.50	1.63
1562828.	785171.	3105137.	1.303	0.595	6.0313	3.932	0.3542	0.3333	0.00556	0.69	0.629	140.5	0.53	1.60
1627909.	580536.	2656785.	1.321	0.593	4.8247	5.822	0.3645	0.3229	0.00662	0.81	0.599	126.3	0.51	1.57
1703308.	659031.	2776067.	1.342	0.590	4.5121	5.224	0.3763	0.3248	0.00693	0.86	0.677	132.4	0.61	1.55
1786840.	516399.	2373376.	1.366	0.601	3.6503	7.310	0.3890	0.3215	0.00739	0.92	0.637	121.3	0.57	1.53
1873365.	672261.	2682935.	1.391	0.591	3.5800	5.581	0.4017	0.3238	0.00683	0.86	0.676	133.4	0.64	1.50
1956062.	629927.	2525335.	1.413	0.594	3.1332	6.293	0.4134	0.3221	0.00637	0.81	0.609	130.1	0.59	1.47
2031839.	649073.	2510613.	1.431	0.594	2.8763	6.302	0.4235	0.3222	0.00553	0.71	0.540	131.3	0.54	1.45
2098361.	750763.	2681073.	1.446	0.590	2.7970	5.457	0.4319	0.3247	0.00480	0.63	0.514	138.2	0.53	1.44
2174577.	839967.	2801114.	1.463	0.590	2.6609	4.935	0.4412	0.3275	0.00391	0.52	0.456	143.7	0.48	1.42
HEAT BALANCE, -0.05 TEST VOLTAGE, 7.1 HEAT INPUT/UNIT AREA, 0.824 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1227915.	774989.	2795353.	1.277	0.626	7.6045	3.086	0.3390	0.3526	0.00380	0.40	0.508	128.5	0.39	1.65
1275183.	619829.	2546802.	1.291	0.593	6.2589	4.116	0.3481	0.3313	0.00467	0.48	0.487	119.0	0.40	1.61
1335068.	476235.	2210465.	1.310	0.594	5.0062	5.850	0.3594	0.3232	0.00582	0.60	0.505	108.5	0.43	1.58
1389956.	490904.	2200746.	1.327	0.593	4.5609	5.860	0.3697	0.3233	0.00647	0.67	0.571	109.8	0.50	1.56
1454685.	449363.	2047230.	1.348	0.598	3.9265	6.797	0.3815	0.3223	0.00739	0.78	0.627	106.4	0.55	1.54
1528689.	492994.	2095399.	1.371	0.595	3.5823	6.384	0.3945	0.3227	0.00775	0.82	0.690	109.9	0.64	1.51
1611828.	310204.	1515195.	1.396	0.635	2.6478	11.668	0.4085	0.3424	0.00822	0.92	0.637	92.9	0.54	1.56
1699465.	359549.	1598753.	1.420	0.625	2.4398	10.337	0.4224	0.3343	0.00772	0.87	0.628	97.7	0.57	1.51
1782340.	467105.	1829522.	1.441	0.603	2.3742	7.931	0.4347	0.3221	0.00699	0.78	0.624	107.0	0.62	1.45
1857157.	491671.	1832728.	1.461	0.602	2.1739	7.774	0.4455	0.3220	0.00604	0.69	0.556	108.6	0.57	1.43
1923829.	559147.	1942173.	1.483	0.596	2.0772	6.896	0.4552	0.3223	0.00525	0.60	0.518	113.5	0.55	1.40
2000027.	563186.	1891866.	1.514	0.597	1.8742	7.116	0.4666	0.3221	0.00432	0.50	0.431	113.3	0.47	1.38

TABLE VI. - Continued. AXIAL HEAT-

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	ROFM
RUN 7-	778	WEIGHT	FLOW,	0.0849	HEAT INPUT,	6.51	INLET BULK TEMP,	58.6	OUTLET BULK TEMP,	69.6	PLJT	CH B			
3.00	372.9	60.8	3.336	69.0	0.027	0.0611	218.	145.	0.00439	1.64	0.65	1.73	2.39	0.091	3.07
4.00	372.8	61.6	3.265	70.5	0.029	0.0678	244.	170.	0.00412	1.76	0.65	1.90	2.76	0.064	2.86
5.00	372.6	62.4	3.178	72.5	0.031	0.0767	264.	188.	0.00432	1.96	0.69	2.14	3.01	0.049	2.66
5.75	372.5	63.1	3.102	74.2	0.032	0.0851	271.	194.	0.00468	2.13	0.73	2.34	3.08	0.041	2.54
6.50	372.2	63.8	3.013	76.4	0.034	0.0955	296.	219.	0.00459	2.20	0.74	2.46	3.43	0.030	2.31
7.25	372.0	64.6	2.913	79.1	0.037	0.1083	318.	242.	0.00440	2.12	0.71	2.43	3.74	0.022	2.10
8.00	371.7	65.5	2.796	82.4	0.040	0.1246	334.	263.	0.00242	1.13	0.53	1.64	7.06	0.007	1.39
8.75	371.4	66.4	2.669	86.3	0.044	0.1442	351.	281.	0.00239	1.08	0.49	1.55	6.79	0.005	1.28
9.50	371.1	67.1	2.556	90.1	0.047	0.1636	368.	317.	0.00309	1.38	0.50	1.72	4.72	0.005	1.46
10.25	370.7	67.7	2.459	93.6	0.051	0.1818	393.	324.	0.00267	1.16	0.43	1.45	4.78	0.003	1.34
11.00	370.3	68.1	2.376	96.9	0.053	0.1985	324.	251.	0.00314	1.30	0.43	1.51	3.68	0.001	1.48
12.00	369.9	68.7	2.286	100.7	0.057	0.2180	336.	266.	0.00245	0.99	0.34	1.18	3.88	-0.031	1.34
RUN 8-	779	WEIGHT	FLOW,	0.1216	HEAT INPUT,	10.30	INLET BULK TEMP,	56.2	OUTLET BULK TEMP,	72.5	PLJT	CH B			
3.00	475.0	59.3	3.639	90.6	0.031	0.0452	272.	155.	0.00613	1.52	0.84	1.59	2.62	0.143	3.42
4.00	475.0	60.4	3.567	92.5	0.033	0.0514	313.	194.	0.00535	1.62	0.80	1.72	3.22	0.095	3.18
5.00	475.0	61.6	3.480	94.8	0.035	0.0596	325.	203.	0.00612	1.88	0.90	2.02	3.30	0.081	3.03
5.75	474.9	62.6	3.403	96.9	0.036	0.0675	325.	201.	0.00703	2.11	0.98	2.27	3.21	0.075	2.93
6.50	474.8	63.7	3.314	99.5	0.038	0.0773	357.	233.	0.00572	2.17	0.98	2.38	3.66	0.055	2.69
7.25	474.4	64.9	3.214	102.6	0.041	0.0895	367.	242.	0.00595	2.22	0.98	2.46	3.73	0.046	2.52
8.00	473.6	66.2	3.098	106.5	0.044	0.1047	531.	415.	0.00421	1.43	0.76	1.82	6.27	0.020	1.87
8.75	472.1	67.4	2.975	110.9	0.048	0.1224	491.	375.	0.00445	1.45	0.73	1.80	5.56	0.018	1.81
9.50	470.9	68.5	2.862	115.2	0.052	0.1401	439.	322.	0.00484	1.51	0.70	1.80	4.70	0.017	1.81
10.25	470.8	69.4	2.766	119.2	0.055	0.1568	431.	315.	0.00437	1.33	0.60	1.57	4.54	0.014	1.72
11.00	471.1	70.2	2.685	122.9	0.058	0.1721	366.	248.	0.00508	1.43	0.63	1.61	3.53	0.015	1.85
12.00	471.3	71.0	2.594	127.1	0.061	0.1902	368.	254.	0.00413	1.14	0.48	1.29	3.58	0.010	1.73
RUN 9-	780	WEIGHT	FLOW,	0.1033	HEAT INPUT,	9.97	INLET BULK TEMP,	57.1	OUTLET BULK TEMP,	74.0	PLJT	CH B			
3.00	445.9	60.3	3.525	79.5	0.029	0.0526	304.	200.	0.00396	1.46	0.67	1.58	3.31	0.082	3.09
4.00	445.6	61.4	3.445	81.3	0.030	0.0600	304.	196.	0.00481	1.72	0.77	1.85	3.19	0.077	3.00
5.00	445.1	62.5	3.349	83.7	0.032	0.0697	317.	206.	0.00544	1.99	0.85	2.16	3.30	0.064	2.83
5.75	444.4	63.5	3.263	85.9	0.034	0.0790	324.	212.	0.00595	2.18	0.91	2.37	3.34	0.055	2.69
6.50	443.4	64.6	3.162	88.6	0.036	0.0909	377.	267.	0.00521	2.05	0.86	2.33	4.14	0.035	2.35
7.25	442.2	65.8	3.044	92.0	0.039	0.1062	445.	339.	0.00440	1.74	0.79	2.10	5.15	0.021	1.98
8.00	440.6	67.2	2.892	96.9	0.044	0.1282	496.	384.	0.00239	0.96	0.64	1.81	11.67	0.006	1.07
8.75	439.3	68.6	2.723	102.9	0.049	0.1558	774.	665.	0.00257	0.95	0.59	1.62	9.70	0.005	1.06
9.50	438.9	69.7	2.586	108.3	0.054	0.1814	501.	397.	0.00359	1.24	0.60	1.61	5.69	0.005	1.32
10.25	438.6	70.6	2.477	113.1	0.058	0.2041	482.	380.	0.00330	1.10	0.52	1.40	5.38	0.003	1.26
11.00	438.7	71.3	2.386	117.4	0.061	0.2247	413.	310.	0.00359	1.16	0.50	1.38	4.34	0.000	1.34
12.00	438.9	72.1	2.288	122.5	0.065	0.2485	398.	297.	0.00314	0.98	0.42	1.15	4.12	-0.003	1.29
RUN 10-	781	WEIGHT	FLOW,	0.0822	HEAT INPUT,	9.55	INLET BULK TEMP,	58.5	OUTLET BULK TEMP,	76.0	PLJT	CH A			
3.00	399.3	61.8	3.306	67.4	0.027	0.0678	286.	192.	0.00406	1.85	0.72	2.01	3.10	0.060	2.82
4.00	399.0	62.9	3.204	69.6	0.029	0.0785	296.	199.	0.00457	2.09	0.79	2.29	3.17	0.050	2.65
5.00	398.6	64.1	3.080	72.4	0.031	0.0928	312.	213.	0.00507	2.35	0.85	2.60	3.33	0.037	2.43
5.75	398.1	65.0	2.969	75.1	0.034	0.1070	353.	255.	0.00462	2.23	0.82	2.56	3.92	0.024	2.13
6.50	397.6	66.2	2.832	78.7	0.037	0.1264	537.	444.	0.00306	1.44	0.69	2.00	6.70	0.009	1.47
7.25	397.1	67.6	2.642	84.4	0.042	0.1571	1024.	919.	0.00195	0.86	0.62	2.03	13.59	0.002	0.77
8.00	396.6	69.0	2.442	91.3	0.048	0.1957	634.	538.	0.00292	1.22	0.64	1.91	7.80	0.001	0.96
8.75	396.1	70.1	2.270	98.2	0.054	0.2338	624.	528.	0.00286	1.13	0.61	1.75	7.54	-0.001	0.85
9.50	395.8	71.2	2.126	104.9	0.059	0.2699	463.	370.	0.00365	1.38	0.64	1.79	5.20	-0.005	0.98
10.25	395.8	72.1	2.011	110.9	0.063	0.3015	433.	341.	0.00350	1.28	0.59	1.60	4.73	-0.009	0.95
11.00	395.9	72.9	1.918	116.3	0.066	0.3295	385.	292.	0.00368	1.30	0.57	1.54	4.00	-0.015	0.99
12.00	396.0	73.8	1.819	122.6	0.070	0.3615	365.	273.	0.00332	1.12	0.50	1.30	3.70	-0.022	0.97
RUN 11-	782	WEIGHT	FLOW,	0.1306	HEAT INPUT,	10.47	INLET BULK TEMP,	59.2	OUTLET BULK TEMP,	73.6	PLJT	CH B			
3.00	454.8	61.8	3.430	103.3	0.039	0.0625	270.	143.	0.00741	1.59	0.82	1.66	2.31	0.129	3.23
4.00	454.5	62.6	3.360	105.4	0.040	0.0697	306.	178.	0.00631	1.68	0.76	1.79	2.84	0.083	2.97
5.00	454.1	63.6	3.274	108.2	0.043	0.0792	326.	195.	0.00673	1.89	0.82	2.04	3.07	0.064	2.78
5.75	453.4	64.5	3.197	110.8	0.045	0.0882	329.	196.	0.00758	2.11	0.89	2.27	3.04	0.058	2.68
6.50	452.5	65.4	3.109	113.9	0.048	0.0993	357.	224.	0.00734	2.18	0.89	2.40	3.42	0.042	2.45
7.25	451.2	66.4	3.010	117.7	0.051	0.1128	363.	228.	0.00772	2.26	0.91	2.50	3.44	0.035	2.30
8.00	449.6	67.4	2.897	122.3	0.055	0.1295	515.	390.	0.00459	1.43	0.70	1.81	5.78	0.014	1.67
8.75	448.4	68.4	2.780	127.4	0.059	0.1483	466.	340.	0.00506	1.51	0.69	1.84	4.96	0.013	1.66
9.50	447.9	69.3	2.676	132.4	0.063	0.1669	421.	293.	0.00550	1.58	0.66	1.85	4.23	0.011	1.68
10.25	447.9	70.1	2.586	137.0	0.067	0.1845	405.	279.	0.00513	1.42	0.58	1.65	3.97	0.008	1.63
11.00	447.9	70.8	2.509	141.2	0.071	0.2006	360.	232.	0.00568	1.46	0.57	1.63	3.27	0.007	1.72
12.00	447.8	71.5	2.423	146.2	0.075	0.2197	361.	237.	0.00461	1.16	0.46	1.31	3.32	0.002	1.61
RUN 12-	783	WEIGHT	FLOW,	0.1073	HEAT INPUT,	9.98	INLET BULK TEMP,	60.9	OUTLET BULK TEMP,	75.0	PLJT	CH C			
3.00	414.5	63.4	3.199	91.0	0.037	0.0816	304.	200.	0.00407	1.45	0.57	1.58	3.15	0.051	2.65
4.00	414.4	64.2	3.118	93.3	0.040	0.0912	305.	197.	0.00488	1.70	0.65	1.85	3.07	0.046	2.56
5.00	414.1	65.1	3.021	96.3	0.042	0.1036	320.	210.	0.00545	1.93	0.72	2.12	3.22	0.036	2.38
5.75	413.8	65.9	2.935	99.2	0.045	0.1153	326.	214.	0.00600	2.10	0.77	2.33	3.25	0.030	2.25
6.50	413.3	66.7	2.835	102.6	0.048	0.1301	383.	273.	0.00517	1.91					

FLUX-GRADIENT (SUPERCRITICAL) RUNS

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DDQL	H/H-H	SIMPLE	NU/NUJ	TJLK
HEAT BALANCE,-0.01 TEST VOLTAGE, 7.2 HEAT INPUT/UNIT AREA, 0.779 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1132427.	564137.	2234443.	1.353	0.601	5.6997	3.899	0.3695	0.3344	0.00460	0.37	0.491	108.0	0.42	1.57
1182117.	461613.	2006348.	1.378	0.590	4.7154	5.133	0.3812	0.3212	0.00556	0.45	0.494	100.6	0.45	1.53
1244618.	408773.	1836071.	1.411	0.594	3.9517	6.230	0.3957	0.3173	0.00673	0.54	0.555	96.2	0.51	1.50
1301499.	398972.	1766121.	1.440	0.596	3.4999	6.698	0.4085	0.3172	0.00752	0.61	0.615	95.2	0.58	1.48
1368939.	345004.	1566242.	1.474	0.606	2.9229	8.382	0.4231	0.3169	0.00859	0.71	0.665	90.1	0.63	1.46
1446964.	310155.	1400967.	1.513	0.619	2.4460	10.070	0.4392	0.3230	0.00911	0.78	0.693	86.4	0.66	1.46
1540122.	126638.	676437.	1.561	0.681	1.5265	31.160	0.4577	0.4044	0.00934	0.96	0.606	62.8	0.67	1.93
1642530.	137414.	663134.	1.629	0.680	1.3251	30.385	0.4787	0.4010	0.00868	0.92	0.585	64.1	0.48	1.90
1735480.	237829.	958333.	1.704	0.654	1.3763	16.697	0.4982	0.3534	0.00786	0.77	0.601	76.8	0.58	1.55
1815326.	239276.	908766.	1.754	0.656	1.2114	17.405	0.5123	0.3566	0.00672	0.68	0.526	76.4	0.51	1.56
1883151.	352258.	1179799.	1.760	0.626	1.2422	11.435	0.5195	0.3272	0.00584	0.57	0.512	87.0	0.56	1.38
1956518.	335996.	1080646.	1.722	0.634	1.0817	12.631	0.5213	0.3330	0.00474	0.48	0.420	84.8	0.46	1.41
HEAT BALANCE,-0.01 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.231 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1332892.	849000.	3054847.	1.229	0.610	8.4021	3.132	0.3191	0.3476	0.00426	0.59	0.567	137.5	0.42	1.70
1393915.	629438.	2682832.	1.238	0.590	6.5452	4.602	0.3289	0.3342	0.00527	0.72	0.542	124.0	0.42	1.67
1471386.	600902.	2565071.	1.249	0.591	5.5284	5.101	0.3409	0.3328	0.00633	0.87	0.631	122.5	0.51	1.64
1541962.	620339.	2547541.	1.260	0.591	4.9261	5.127	0.3516	0.3329	0.00704	0.97	0.714	124.2	0.60	1.62
1626392.	515454.	2246769.	1.272	0.601	3.9862	6.713	0.3639	0.3336	0.00812	1.14	0.758	116.4	0.63	1.60
1725324.	500842.	2128682.	1.286	0.606	3.3793	7.351	0.3778	0.3362	0.00860	1.23	0.801	115.2	0.69	1.58
1843273.	240536.	1242808.	1.301	0.668	2.1969	18.728	0.3931	0.3953	0.00895	1.47	0.721	88.9	0.53	1.44
1972578.	287799.	1317735.	1.312	0.660	1.9654	16.124	0.4084	0.3853	0.00839	1.37	0.707	94.4	0.56	1.76
2092887.	368715.	1484259.	1.320	0.645	1.8380	12.816	0.4213	0.3650	0.00762	1.23	0.686	102.6	0.60	1.64
2197622.	391972.	1474213.	1.326	0.642	1.6468	12.536	0.4317	0.3625	0.00654	1.07	0.606	104.5	0.56	1.62
2285899.	560444.	1834503.	1.334	0.612	1.6763	8.507	0.4403	0.3390	0.00567	0.90	0.585	118.5	0.60	1.49
2384188.	558162.	1751819.	1.346	0.616	1.4811	8.933	0.4497	0.3412	0.00462	0.76	0.484	117.7	0.51	1.49
HEAT BALANCE,-0.02 TEST VOLTAGE, 9.3 HEAT INPUT/UNIT AREA, 1.202 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1218618.	493037.	2241238.	1.257	0.591	6.1069	5.185	0.3359	0.3291	0.00504	0.55	0.463	107.3	0.37	1.64
1280347.	514857.	2237687.	1.271	0.591	5.4280	5.153	0.3474	0.3295	0.00584	0.65	0.550	109.4	0.45	1.62
1357638.	487445.	2116845.	1.289	0.594	4.5505	5.802	0.3614	0.3282	0.00700	0.78	0.641	107.5	0.54	1.59
1428807.	478309.	2039427.	1.306	0.595	3.9570	6.227	0.3738	0.3277	0.00783	0.88	0.712	106.9	0.62	1.55
1515418.	354813.	1647488.	1.326	0.622	3.0519	9.399	0.3884	0.3403	0.00902	1.06	0.748	96.0	0.63	1.58
1620072.	261706.	1272592.	1.347	0.653	2.3127	14.364	0.4047	0.3685	0.00959	1.20	0.755	86.1	0.61	1.68
1760148.	77809.	446478.	1.370	0.693	1.2406	61.570	0.4245	0.4080	0.01053	1.72	0.698	57.2	0.51	2.45
1918132.	106936.	514199.	1.397	0.678	1.0971	48.216	0.4450	0.4185	0.00928	1.53	0.662	62.7	0.51	2.35
2048170.	240227.	915069.	1.432	0.668	1.2049	20.229	0.4617	0.3899	0.00797	1.18	0.668	81.9	0.59	1.80
2151434.	266210.	928650.	1.452	0.665	1.0781	18.907	0.4730	0.3852	0.00679	1.02	0.593	84.2	0.55	1.76
2236285.	366678.	1140999.	1.444	0.645	1.0662	13.511	0.4784	0.3584	0.00590	0.86	0.564	93.7	0.58	1.57
2325635.	404037.	1166413.	1.406	0.640	0.9659	12.559	0.4794	0.3533	0.00478	0.71	0.478	96.3	0.51	1.54
HEAT BALANCE,-0.03 TEST VOLTAGE, 9.4 HEAT INPUT/UNIT AREA, 1.661 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1113646.	395884.	1780615.	1.337	0.593	4.5865	5.801	0.3718	0.3223	0.00648	0.53	0.545	92.4	0.48	1.55
1183393.	384569.	1679775.	1.368	0.595	3.8846	6.361	0.3879	0.3215	0.00755	0.62	0.628	91.4	0.57	1.52
1271098.	361002.	1567967.	1.404	0.601	3.1664	7.355	0.4071	0.3209	0.00898	0.76	0.733	89.2	0.69	1.49
1352423.	289785.	1303502.	1.436	0.623	2.4999	10.173	0.4238	0.3311	0.01005	0.88	0.774	82.1	0.71	1.50
1456274.	137015.	699515.	1.474	0.677	1.5932	26.861	0.4436	0.4002	0.01113	1.15	0.756	62.8	0.59	1.89
1602147.	47784.	248519.	1.545	0.690	0.8687	93.063	0.4711	0.4049	0.01272	1.66	0.760	44.1	0.60	2.72
1758401.	118275.	471895.	1.619	0.681	0.8981	38.670	0.4972	0.4121	0.01107	1.37	0.798	58.3	0.69	2.13
1886979.	130039.	452366.	1.568	0.681	0.7370	37.555	0.5026	0.4117	0.01004	1.31	0.769	59.3	0.69	2.13
1995789.	232011.	681216.	1.477	0.667	0.7396	20.055	0.4987	0.3796	0.00896	1.09	0.789	71.3	0.80	1.73
2075606.	274775.	733119.	1.412	0.660	0.6698	17.184	0.4950	0.3684	0.00758	0.94	0.716	74.8	0.76	1.64
2137050.	356584.	868579.	1.358	0.643	0.6433	13.024	0.4909	0.3471	0.00660	0.81	0.682	81.3	0.78	1.49
2198630.	409677.	923035.	1.290	0.636	0.5852	11.390	0.4843	0.3403	0.00530	0.66	0.588	84.6	0.69	1.44
HEAT BALANCE,-0.08 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.250 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1632057.	1026538.	3372997.	1.268	0.624	6.2920	3.051	0.3490	0.3540	0.00407	0.60	0.605	155.1	0.49	1.63
1703076.	768295.	2959732.	1.280	0.591	4.9819	4.439	0.3590	0.3340	0.00503	0.73	0.558	139.9	0.48	1.60
1792829.	687445.	2738011.	1.295	0.591	4.1696	5.310	0.3713	0.3305	0.00609	0.89	0.626	134.5	0.56	1.57
1874902.	696401.	2694752.	1.309	0.591	3.7329	5.454	0.3822	0.3302	0.00679	1.00	0.704	135.3	0.64	1.55
1972263.	592554.	2388025.	1.324	0.599	3.0863	6.948	0.3945	0.3287	0.00780	1.16	0.751	127.5	0.69	1.53
2084708.	590006.	2295156.	1.339	0.602	2.6753	7.375	0.4077	0.3300	0.00825	1.25	0.800	127.1	0.76	1.51
2215578.	286781.	1319376.	1.353	0.665	1.7717	18.383	0.4219	0.3880	0.00854	1.48	0.709	98.0	0.57	1.78
2353127.	361520.	1469288.	1.368	0.653	1.6407	14.933	0.4357	0.3705	0.00800	1.37	0.707	105.8	0.62	1.67
2476982.	459032.	1660853.	1.387	0.636	1.5515	11.876	0.4480	0.3515	0.00728	1.23	0.690	114.6	0.67	1.55
2584622.	508114.	1709260.	1.407	0.630	1.4240	10.999	0.4584	0.3465	0.00624	1.07	0.617	118.2	0.62	1.52
2675966.	671909.	2026642.	1.420	0.607	1.4194	8.136	0.4664	0.3317	0.00541	0.91	0.593	130.3	0.65	1.42
2776879.	669580.	1939369.	1.421	0.610	1.2619	8.503	0.4727	0.3336	0.00441	0.77	0.491	129.3	0.55	1.42
HEAT BALANCE,-0.07 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.208 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1545913.	517397.	2203328.	1.351	0.594	3.8097	6.151	0.3866	0.3239	0.00497	0.55	0.451	113.5	0.41	1.53
1620183.	536915.	2189671.	1.371	0.594	3.4268	6.157	0.3988	0.3241	0.00575	0.65	0.534	114.9	0.50	1.51
1711796.	505966.	2043527.	1.394	0.598	2.9135	6.978	0.4130	0.3233	0.00686	0.79	0.624	112.2	0.60	1.48
1794201.	503073.	1971410.	1.413	0.600	2.5782	7.363	0.4250	0.3231	0.00763	0.89	0.697	111.7	0.69	1.46
1891975.	370331.	1536904.	1.435	0.630	2.0122	11.218	0.4385	0.3395	0.00867	1.07	0.731	99.5	0.69	1.51
2007046.	282361.	1183475.	1.466	0.657	1.5648	16.427	0.4541	0.3672	0.00909	1.21	0.737	89.9	0.66	1.64
2155221.	87533.	409260.	1.522	0.690	0.8637	66.972	0.4744	0.4092	0.00975	1.71	0.673	60.2	0.55	2.51
2316619.	125368.	488972.	1.554	0.679	0.7844	49.317	0.4912	0.4177	0.00852	1.51	0.646	66.7	0.55	2.35
2445903.	263387.	852629.	1.512	0.671	0.8493	22.054	0.4945	0.3887	0.00741	1.18	0.656	84.9	0.63	1.81
2543117.	300020.	893023.	1.453	0.667	0.7749	19.758	0.4924	0.3818	0.00631	1.02	0.587	88.0	0.59	1.74
2618336.	407946.	1104886.	1.405	0.648	0.7712	14.193	0.4898	0.3553	0.00550	0.86	0.560	97.4	0.61	1.55
2695370.	469588.	1182642.	1.357	0.639	0.7181	12.391	0.4869	0.3463	0.00446	0.70	0.482	101.6	0.55	1.48

TABLE VI. - Continued. AXIAL HEAT-

EL	PB	T8	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HMW	H/HF	TW/TB	THETA	ROFM
RUN 13- 784 WEIGHT FLOW, 0.0876 HEAT INPUT, 9.64 INLET BULK TEMP, 62.0 OUTLET BULK TEMP, 77.5 PLOT CH J															
3.00	413.9	64.7	3.058	77.7	0.034	0.0987	297.	201.	0.00398	1.63	0.61	1.78	3.10	0.041	2.46
4.00	413.8	65.6	2.960	80.3	0.036	0.1118	302.	203.	0.00463	1.86	0.69	2.04	3.10	0.034	2.33
5.00	413.7	66.6	2.843	83.6	0.039	0.1289	320.	220.	0.00505	2.06	0.75	2.30	3.30	0.024	2.12
5.75	413.4	67.5	2.740	86.7	0.042	0.1454	343.	243.	0.00507	2.08	0.76	2.36	3.60	0.016	1.91
6.50	412.8	68.4	2.616	90.8	0.045	0.1671	463.	368.	0.00372	1.53	0.67	1.96	3.60	0.006	1.41
7.25	411.9	69.5	2.465	96.4	0.050	0.1968	635.	537.	0.00289	1.14	0.61	1.75	7.73	0.002	0.98
8.00	410.7	70.6	2.300	103.3	0.056	0.2332	633.	535.	0.00301	1.13	0.62	1.73	7.57	-0.001	0.86
8.75	408.8	71.8	2.133	111.4	0.062	0.2747	835.	735.	0.00231	0.83	0.57	1.57	10.23	-0.003	0.59
9.50	405.9	72.9	1.987	119.6	0.067	0.3143	486.	392.	0.00356	1.20	0.62	1.57	5.37	-0.009	0.85
10.25	404.7	73.8	1.881	126.3	0.072	0.3464	451.	358.	0.00342	1.11	0.57	1.40	4.85	-0.014	0.84
11.00	406.2	74.7	1.802	131.8	0.075	0.3736	494.	299.	0.00368	1.16	0.56	1.38	4.00	-0.021	0.90
12.00	407.4	75.8	1.719	138.2	0.078	0.4041	370.	276.	0.00337	1.02	0.49	1.18	3.65	-0.028	0.90
RUN 14- 786 WEIGHT FLOW, 0.1034 HEAT INPUT, 7.04 INLET BULK TEMP, 49.5 OUTLET BULK TEMP, 67.9 PLOT CH E															
3.00	457.7	52.7	3.998	67.0	0.020	0.0205	210.	130.	0.00531	1.27	0.98	1.31	2.47	0.253	3.33
4.00	457.6	53.8	3.942	68.0	0.021	0.0234	215.	134.	0.00611	1.54	1.11	1.59	2.48	0.232	3.86
5.00	457.5	55.1	3.873	69.2	0.022	0.0274	227.	145.	0.00664	1.89	1.20	1.96	2.63	0.191	3.74
5.75	457.4	56.1	3.812	70.3	0.023	0.0313	234.	152.	0.00712	2.15	1.28	2.24	2.70	0.169	3.64
6.50	457.1	57.3	3.739	71.7	0.024	0.0362	264.	181.	0.00654	2.35	1.23	2.48	3.15	0.121	3.46
7.25	456.9	58.6	3.657	73.3	0.025	0.0424	261.	176.	0.00736	2.56	1.31	2.70	3.01	0.116	3.36
8.00	456.7	60.0	3.566	75.1	0.027	0.0500	330.	249.	0.00510	2.20	1.04	2.43	4.15	0.065	3.00
8.75	456.5	61.3	3.473	77.2	0.028	0.0585	280.	196.	0.00657	2.41	1.11	2.58	3.19	0.082	3.04
9.50	456.4	62.4	3.386	79.1	0.030	0.0671	275.	191.	0.00631	2.24	1.01	2.40	3.07	0.076	2.94
10.25	456.2	63.3	3.308	81.0	0.032	0.0755	270.	188.	0.00566	1.95	0.86	2.09	2.97	0.071	2.86
11.00	456.0	64.1	3.240	82.7	0.033	0.0834	246.	166.	0.00599	1.84	0.83	1.94	2.59	0.080	2.88
12.00	455.7	64.9	3.163	84.7	0.035	0.0929	246.	168.	0.00490	1.49	0.66	1.59	2.58	0.071	2.77
RUN 15- 787 WEIGHT FLOW, 0.0898 HEAT INPUT, 6.85 INLET BULK TEMP, 51.1 OUTLET BULK TEMP, 69.1 PLOT CH F															
3.00	425.9	54.3	3.881	60.0	0.019	0.0256	206.	131.	0.00502	1.48	0.97	1.53	2.41	0.216	3.79
4.00	425.8	55.4	3.818	60.9	0.020	0.0292	213.	137.	0.00564	1.77	1.07	1.84	2.46	0.191	3.70
5.00	425.7	56.7	3.741	62.2	0.021	0.0342	228.	152.	0.00592	2.13	1.14	2.23	2.68	0.149	3.55
5.75	425.6	57.8	3.672	63.4	0.022	0.0390	240.	163.	0.00510	2.37	1.18	2.50	2.83	0.124	3.42
6.50	425.4	58.9	3.589	64.8	0.023	0.0453	281.	203.	0.00535	2.46	1.11	2.66	3.44	0.083	3.17
7.25	425.0	60.2	3.494	66.6	0.024	0.0532	290.	211.	0.00553	2.57	1.11	2.80	3.51	0.070	3.00
8.00	424.7	61.6	3.386	68.7	0.026	0.0633	412.	340.	0.00349	1.82	0.85	2.18	5.52	0.033	2.46
8.75	424.5	62.9	3.272	71.1	0.028	0.0750	369.	295.	0.00387	1.93	0.83	2.25	4.70	0.034	2.41
9.50	424.2	64.0	3.168	73.5	0.030	0.0869	329.	254.	0.00424	1.99	0.80	2.25	3.97	0.036	2.40
10.25	423.8	64.9	3.075	75.7	0.032	0.0984	325.	251.	0.00376	1.71	0.67	1.94	3.87	0.032	2.29
11.00	423.5	65.6	2.995	77.7	0.034	0.1091	277.	202.	0.00432	1.75	0.67	1.91	3.08	0.038	2.39
12.00	423.3	66.4	2.907	80.1	0.036	0.1218	282.	210.	0.00342	1.38	0.52	1.53	3.15	0.030	2.24
RUN 16- 792 WEIGHT FLOW, 0.1140 HEAT INPUT, 10.38 INLET BULK TEMP, 70.9 OUTLET BULK TEMP, 85.6 PLOT CH G															
3.00	422.7	72.5	2.141	138.0	0.075	0.2795	316.	220.	0.00399	1.09	0.43	1.21	3.03	-0.012	1.40
4.00	422.5	73.1	2.070	142.7	0.078	0.2989	320.	221.	0.00471	1.26	0.51	1.40	3.02	-0.016	1.34
5.00	422.3	73.9	1.989	148.5	0.082	0.3228	335.	235.	0.00532	1.41	0.60	1.58	3.18	-0.020	1.22
5.75	421.9	74.6	1.919	153.9	0.086	0.3444	343.	241.	0.00585	1.52	0.67	1.72	3.24	-0.023	1.14
6.50	421.1	75.3	1.840	160.6	0.090	0.3702	388.	287.	0.00551	1.44	0.69	1.69	3.81	-0.022	0.96
7.25	420.1	76.3	1.753	168.5	0.094	0.3998	406.	305.	0.00560	1.43	0.73	1.69	4.00	-0.025	0.87
8.00	419.1	77.4	1.662	177.7	0.099	0.4332	526.	428.	0.00420	1.04	0.67	1.37	5.53	-0.019	0.63
8.75	417.9	78.6	1.574	187.6	0.105	0.4673	483.	385.	0.00445	1.07	0.68	1.34	4.90	-0.026	0.64
9.50	416.3	79.7	1.498	197.2	0.109	0.4980	442.	344.	0.00462	1.07	0.67	1.29	4.32	-0.035	0.66
10.25	414.5	80.7	1.434	206.0	0.114	0.5245	428.	331.	0.00421	0.95	0.61	1.13	4.10	-0.041	0.64
11.00	413.4	81.7	1.383	213.5	0.117	0.5464	386.	288.	0.00434	0.95	0.59	1.09	3.53	-0.055	0.69
12.00	412.8	82.8	1.331	221.9	0.121	0.5700	382.	287.	0.00361	0.77	0.49	0.88	3.47	-0.061	0.66
RUN 17- 793 WEIGHT FLOW, 0.0998 HEAT INPUT, 10.17 INLET BULK TEMP, 71.7 OUTLET BULK TEMP, 91.0 PLOT CH H															
3.00	407.4	73.5	1.936	133.6	0.075	0.3307	312.	221.	0.00378	1.10	0.45	1.23	3.00	-0.023	1.22
4.00	407.0	74.1	1.865	138.6	0.078	0.3530	318.	224.	0.00440	1.26	0.53	1.40	3.02	-0.027	1.15
5.00	406.7	75.0	1.784	145.0	0.082	0.3803	341.	246.	0.00477	1.36	0.61	1.54	3.29	-0.029	1.02
5.75	406.3	75.7	1.715	150.8	0.086	0.4047	354.	258.	0.00512	1.43	0.68	1.64	3.41	-0.031	0.94
6.50	405.6	76.6	1.637	158.0	0.090	0.4338	422.	328.	0.00454	1.26	0.69	1.52	4.28	-0.027	0.75
7.25	404.5	77.8	1.552	166.7	0.094	0.4671	446.	352.	0.00458	1.23	0.74	1.51	4.53	-0.029	0.66
8.00	403.5	79.2	1.462	176.9	0.099	0.5041	605.	509.	0.00344	0.91	0.69	1.28	6.43	-0.022	0.46
8.75	402.5	80.8	1.376	187.9	0.104	0.5415	579.	484.	0.00346	0.88	0.69	1.19	6.00	-0.027	0.45
9.50	401.5	82.3	1.304	198.3	0.109	0.5741	494.	402.	0.00379	0.93	0.70	1.16	4.89	-0.039	0.50
10.25	400.5	83.7	1.246	207.5	0.113	0.6011	475.	385.	0.00345	0.82	0.63	1.00	4.61	-0.046	0.49
11.00	399.1	84.9	1.199	215.7	0.117	0.6233	422.	332.	0.00356	0.82	0.60	0.95	3.91	-0.062	0.53
12.00	398.1	86.4	1.150	224.8	0.120	0.6467	412.	325.	0.00302	0.68	0.51	0.78	3.76	-0.070	0.52
RUN 18- 794 WEIGHT FLOW, 0.1263 HEAT INPUT, 10.50 INLET BULK TEMP, 70.2 OUTLET BULK TEMP, 82.9 PLOT CH I															
3.00	404.3	71.6	2.125	154.0	0.086	0.2745	318.	220.	0.00408	1.06	0.40	1.18	3.07	-0.012	1.38
4.00	404.1	72.2	2.058	159.0	0.089	0.2927	322.	222.	0.00479	1.22	0.47	1.37	3.07	-0.015	1.32
5.00	403.8	72.8	1.980	165.3	0.093	0.3150	336.	233.	0.00549	1.38	0.56	1.56	3.19	-0.018	1.21
5.75	403.0	73.4	1.913	171.1	0.097	0.3353	340.	235.	0.00616	1.52	0.63	1.71	3.20	-0.022	1.15
6.50	402.5	74.1	1.838	178.0	0.101	0.3591	377.	273.	0.00596	1.47	0.66	1.71	3.68	-0.021	0.99
7.25	402.2	74.9	1.759	186.1	0.106	0.3863	386.	281.	0.00623	1.50	0.71	1.76	3.76	-0.025	0.91
8.00	401.5	75.9	1.674	195.5	0.111	0.4169	496.	396.	0.00460	1.09	0.64	1.40	5.21	-0.019	0.67
8.75	400.7	76.9	1.591	205.7	0.117	0.4485	474.	374.	0.00468	1.07	0.64	1.34	4.86	-0.024	0.65
9.50	399.9	77.9	1.520	215.4	0.122	0.4770	418.	316.	0.00516	1.14	0.65	1.35	4.05	-0.034	0.70
10.25	399.1	78.8	1.461	224.1	0.126	0.5015	403.	302.	0.00473	1.02	0.59	1.19	3.83	-0.041	0.70
11.00	398.5	79.6	1.413	231.7	0.130	0.5220	367.	266.	0.00486	1.01	0.57	1.14	3.34	-0.054	0.74
12.00	398.1	80.6	1.363	240.2	0.134	0.5443	362.	264.	0.00405	0.82	0.48	0.92	3.28	-0.060	0.72



FLUX-GRADIENT (SUPERCRITICAL) RUNS

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DQDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE,-0.00 TEST VOLTAGE, 9.3 HEAT INPUT/UNIT AREA, 1.350 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1368690.	433296.	1740467.	1.386	0.595	3.1294	6.454	0.4077	0.3237	0.00583	0.54	0.519	97.2	0.50	1.49
1444856.	437965.	1691152.	1.408	0.596	2.7351	6.721	0.4215	0.3235	0.00674	0.64	0.608	97.3	0.60	1.46
1538055.	406091.	1539692.	1.432	0.602	2.2619	7.842	0.4373	0.3232	0.00799	0.77	0.706	94.2	0.71	1.44
1621677.	366580.	1372632.	1.459	0.615	1.8942	9.368	0.4511	0.3297	0.00882	0.89	0.766	90.3	0.78	1.45
1723193.	213180.	854135.	1.503	0.665	1.3249	18.979	0.4682	0.3793	0.00974	1.11	0.763	73.9	0.68	1.71
1847246.	129608.	510255.	1.550	0.680	0.9124	36.939	0.4867	0.4127	0.00998	1.35	0.744	61.6	0.64	2.13
1980296.	138835.	481323.	1.519	0.680	0.7499	36.832	0.4941	0.4126	0.00979	1.40	0.768	62.2	0.69	2.15
2110951.	91984.	292755.	1.427	0.681	0.5219	62.146	0.4912	0.4133	0.00925	1.53	0.708	53.5	0.67	2.55
2219417.	248114.	653011.	1.358	0.670	0.6013	20.984	0.4880	0.3873	0.00790	1.13	0.746	73.9	0.76	1.81
2292510.	296191.	714598.	1.300	0.665	0.5512	17.690	0.4835	0.3774	0.00673	0.97	0.678	77.8	0.72	1.71
2341034.	396751.	880391.	1.240	0.646	0.5427	12.790	0.4770	0.3521	0.00587	0.83	0.653	85.6	0.75	1.53
2389046.	462006.	955614.	1.169	0.636	0.5038	10.898	0.4682	0.3435	0.00474	0.68	0.567	89.6	0.67	1.46
HEAT BALANCE,-0.15 TEST VOLTAGE, 7.1 HEAT INPUT/UNIT AREA, 0.866 ID, 0.260 OD, 0.370 LENGTH, 16.0														
877409.	859170.	2786153.	1.203	0.713	19.8226	2.131	0.2727	0.3836	0.00356	0.41	0.640	119.4	0.36	1.81
911211.	827948.	2766950.	1.205	0.686	17.0730	2.272	0.2796	0.3761	0.00429	0.49	0.719	119.1	0.42	1.80
953577.	736835.	2692998.	1.209	0.636	13.9107	2.659	0.2883	0.3590	0.00542	0.60	0.765	115.6	0.49	1.77
992666.	693982.	2633908.	1.214	0.617	11.9163	2.928	0.2963	0.3508	0.00626	0.68	0.809	114.1	0.55	1.75
1040222.	547161.	2406586.	1.222	0.591	9.3552	3.980	0.3059	0.3351	0.00760	0.81	0.775	105.7	0.56	1.72
1096410.	572479.	2407538.	1.233	0.592	8.1483	3.949	0.3171	0.3359	0.00811	0.87	0.848	108.2	0.64	1.69
1161262.	358468.	1897061.	1.245	0.609	5.7902	7.173	0.3297	0.3347	0.00903	0.96	0.742	92.1	0.54	1.67
1230277.	511446.	2195008.	1.260	0.591	5.6381	4.982	0.3428	0.3311	0.00818	0.88	0.783	105.0	0.64	1.63
1296826.	536114.	2191904.	1.274	0.590	4.9810	4.944	0.3551	0.3316	0.00747	0.81	0.735	107.1	0.62	1.61
1359089.	558494.	2188191.	1.288	0.590	4.4698	4.917	0.3663	0.3320	0.00642	0.71	0.648	108.9	0.57	1.58
1414867.	672058.	2350233.	1.299	0.594	4.3281	4.095	0.3759	0.3374	0.00547	0.61	0.634	116.7	0.57	1.56
1479553.	672849.	2308182.	1.312	0.592	3.8544	4.260	0.3867	0.3364	0.00448	0.50	0.518	116.8	0.48	1.54
HEAT BALANCE,-0.13 TEST VOLTAGE, 7.2 HEAT INPUT/UNIT AREA, 0.836 ID, 0.260 OD, 0.370 LENGTH, 16.0														
825357.	702610.	2457640.	1.213	0.676	15.3077	2.408	0.2875	0.3726	0.00414	0.38	0.638	108.0	0.39	1.77
860132.	663064.	2418220.	1.220	0.648	13.0746	2.637	0.2958	0.3627	0.00501	0.46	0.701	106.8	0.45	1.75
904255.	574154.	2305845.	1.230	0.608	10.5388	3.211	0.3063	0.3443	0.00633	0.56	0.731	102.5	0.52	1.72
945404.	521579.	2207280.	1.241	0.595	8.8829	3.711	0.3159	0.3353	0.00733	0.64	0.759	99.7	0.57	1.69
996195.	389548.	1919221.	1.255	0.593	6.8302	5.445	0.3276	0.3258	0.00887	0.77	0.744	90.4	0.57	1.66
1057258.	374016.	1831419.	1.273	0.596	5.7125	6.027	0.3414	0.3250	0.00957	0.84	0.787	89.5	0.62	1.63
1130140.	195039.	1215663.	1.296	0.654	3.7862	13.724	0.3574	0.3658	0.01041	0.97	0.726	71.3	0.50	1.71
1210002.	245190.	1326855.	1.322	0.637	3.4375	11.252	0.3744	0.3474	0.00971	0.90	0.715	77.3	0.55	1.63
1286468.	311589.	1469647.	1.347	0.618	3.2015	9.015	0.3900	0.3335	0.00868	0.81	0.685	84.1	0.58	1.56
1356622.	324623.	1449660.	1.368	0.617	2.8389	9.051	0.4036	0.3327	0.00741	0.70	0.598	85.2	0.53	1.53
1418229.	446353.	1710966.	1.384	0.595	2.8492	6.458	0.4147	0.3250	0.00629	0.59	0.576	95.5	0.56	1.48
1488011.	435185.	1629953.	1.400	0.597	2.4932	6.985	0.4266	0.3245	0.00513	0.49	0.469	94.4	0.47	1.46
HEAT BALANCE,-0.05 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.278 ID, 0.260 OD, 0.370 LENGTH, 16.0														
2663795.	675101.	1697311.	1.380	0.604	0.9477	7.873	0.4839	0.3257	0.00399	0.59	0.475	116.5	0.57	1.34
2728762.	690565.	1668291.	1.342	0.605	0.8676	7.867	0.4819	0.3261	0.00462	0.70	0.564	116.7	0.69	1.34
2801409.	661150.	1541781.	1.301	0.613	0.7622	8.558	0.4792	0.3303	0.00543	0.86	0.667	113.8	0.81	1.37
2861142.	656868.	1476261.	1.264	0.617	0.6889	8.843	0.4762	0.3326	0.00600	0.98	0.748	112.8	0.91	1.38
2926491.	538110.	1186465.	1.218	0.639	0.5724	11.600	0.4718	0.3489	0.00656	1.17	0.794	103.9	0.92	1.50
2992966.	517784.	1088254.	1.159	0.647	0.4973	12.491	0.4651	0.3566	0.00689	1.28	0.836	101.5	0.96	1.56
3057305.	337793.	693471.	1.089	0.675	0.3734	21.743	0.4558	0.4000	0.00667	1.47	0.759	86.3	0.81	1.97
3113535.	410765.	785000.	1.017	0.669	0.3479	17.321	0.4453	0.3878	0.00619	1.37	0.755	91.6	0.83	1.84
3157217.	500556.	899448.	0.956	0.661	0.3295	13.920	0.4355	0.3749	0.00559	1.22	0.734	97.6	0.83	1.72
3189879.	547332.	940177.	0.907	0.658	0.3057	12.666	0.4270	0.3694	0.00473	1.05	0.650	100.2	0.75	1.68
3211671.	680123.	1117321.	0.869	0.643	0.3023	9.794	0.4199	0.3512	0.00414	0.90	0.618	108.0	0.75	1.53
3229088.	704885.	1119322.	0.832	0.643	0.2789	9.443	0.4124	0.3512	0.00331	0.74	0.511	108.9	0.62	1.53
HEAT BALANCE,-0.08 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.257 ID, 0.260 OD, 0.370 LENGTH, 16.0														
2509058.	626425.	1432609.	1.324	0.607	0.7449	7.964	0.4850	0.3240	0.00414	0.56	0.510	105.2	0.63	1.32
2561501.	633633.	1392781.	1.282	0.609	0.6761	8.047	0.4812	0.3252	0.00478	0.66	0.602	104.9	0.75	1.32
2618750.	580787.	1233844.	1.225	0.622	0.5814	9.207	0.4751	0.3325	0.00558	0.82	0.696	100.6	0.85	1.38
2664316.	563587.	1153710.	1.170	0.628	0.5184	9.761	0.4684	0.3369	0.00613	0.94	0.773	98.7	0.94	1.41
2712773.	423548.	848694.	1.103	0.657	0.4155	14.137	0.4594	0.3657	0.00668	1.14	0.795	88.1	0.90	1.63
2760752.	402156.	765537.	1.029	0.664	0.3565	15.383	0.4483	0.3766	0.00687	1.26	0.830	85.7	0.93	1.73
2803715.	250898.	461300.	0.952	0.680	0.2615	27.916	0.4356	0.4115	0.00666	1.48	0.759	71.9	0.81	2.20
2837409.	284792.	490535.	0.882	0.680	0.2356	24.499	0.4223	0.4104	0.00608	1.40	0.734	74.5	0.80	2.15
2859191.	387984.	628570.	0.829	0.674	0.2302	16.910	0.4122	0.3929	0.00544	1.21	0.720	82.5	0.81	1.92
2871912.	428075.	665235.	0.789	0.672	0.2138	15.079	0.4035	0.3882	0.00458	1.04	0.635	85.0	0.72	1.87
2879903.	541391.	809094.	0.760	0.661	0.2119	11.394	0.3965	0.3705	0.00400	0.88	0.602	92.2	0.71	1.70
2883346.	576954.	834877.	0.732	0.660	0.1967	10.567	0.3892	0.3678	0.00320	0.72	0.502	94.0	0.59	1.68
HEAT BALANCE,-0.05 TEST VOLTAGE, 9.2 HEAT INPUT/UNIT AREA, 1.287 ID, 0.260 OD, 0.370 LENGTH, 16.0														
2988507.	728785.	1877947.	1.441	0.606	0.9455	8.237	0.4935	0.3228	0.00382	0.60	0.452	125.7	0.55	1.33
3058372.	741803.	1840819.	1.404	0.607	0.8684	8.275	0.4916	0.3234	0.00442	0.72	0.535	125.7	0.65	1.32
3136893.	718891.	1720827.	1.363	0.614	0.7706	8.858	0.4890	0.3270	0.00522	0.88	0.637	123.2	0.78	1.34
3203510.	729368.	1679797.	1.327	0.616	0.7046	8.920	0.4864	0.3279	0.00578	1.00	0.722	123.0	0.88	1.35
3273500.	618021.	1394240.	1.279	0.635	0.5965	11.216	0.4820	0.3440	0.00642	1.18	0.775	114.7	0.91	1.44
3343486.	616636.	1325399.	1.220	0.639	0.5298	11.540	0.4752	0.3444	0.00670	1.29	0.828	113.6	0.98	1.47
3413862.	401067.	847661.	1.149	0.672	0.4008	19.811	0.4662	0.3890	0.00650	1.47	0.746	96.4	0.80	1.95
3476119.	454621.	900597.	1.075	0.669	0.3677	17.475	0.4557	0.3827	0.00603	1.39	0.730	99.9	0.80	1.79
3524432.	598074.	1109182.	1.011	0.654	0.3605	12.803	0.4458	0.3602	0.00548	1.23	0.730	109.4	0.85	1.60
3560424.	657674.	1167156.	0.960	0.649	0.3379	11.560	0.4373	0.3545	0.00465	1.06	0.650	112.5	0.77	1.55
3586009.	803841.	1365464.	0.919	0.635	0.3342	9.115	0.4302	0.3399	0.00406	0.90	0.617	120.6	0.76	1.44
3608702.	833945.	1370087.	0.879	0.634	0.3100	8.784	0.4225	0.3398	0.00326	0.74	0.511	121.6	0.63	1.44

TABLE VI. - Concluded. AXIAL HEAT-

EL	PB	TB	ROB	VELOC	M	X2	TO	TW	H	H/HHK	H/HHW	H/HF	TW/TB	THETA	ROFM
RUN 19- 795 WEIGHT FLOW, 0.0856 HEAT INPUT, 9.97 INLET BULK TEMP, 71.6 OUTLET BULK TEMP, 95.3 PLOT CH J															
3.00	410.6	73.5	1.948	113.8	0.064	0.3286	309.	222.	0.00353	1.16	0.48	1.30	3.02	-0.023	1.23
4.00	409.9	74.3	1.870	118.6	0.067	0.3531	319.	231.	0.00400	1.30	0.56	1.46	3.11	-0.026	1.14
5.00	409.4	75.2	1.780	124.6	0.071	0.3833	346.	256.	0.00429	1.38	0.64	1.58	3.41	-0.028	0.99
5.75	409.0	76.0	1.704	130.2	0.074	0.4106	370.	280.	0.00440	1.40	0.69	1.63	3.69	-0.029	0.88
6.50	407.9	77.1	1.617	137.2	0.078	0.4432	449.	362.	0.00388	1.21	0.71	1.50	4.69	-0.025	0.69
7.25	406.2	78.4	1.521	145.8	0.082	0.4810	493.	405.	0.00378	1.14	0.75	1.46	5.17	-0.026	0.58
8.00	404.8	80.1	1.418	156.4	0.087	0.5243	753.	661.	0.00267	0.81	0.71	1.30	8.25	-0.018	0.36
8.75	403.6	82.1	1.322	167.8	0.092	0.5675	632.	541.	0.00299	0.86	0.73	1.21	6.60	-0.027	0.40
9.50	402.3	84.0	1.244	178.3	0.097	0.6035	564.	475.	0.00309	0.84	0.71	1.11	5.66	-0.036	0.41
10.25	401.2	85.7	1.182	187.6	0.101	0.6330	536.	450.	0.00283	0.74	0.64	0.95	5.26	-0.044	0.41
11.00	400.4	87.2	1.134	195.5	0.104	0.6565	460.	377.	0.00297	0.75	0.61	0.90	4.32	-0.050	0.46
12.00	399.9	89.0	1.086	204.3	0.107	0.6809	444.	363.	0.00256	0.63	0.52	0.74	4.08	-0.070	0.46
RUN 20- 796 WEIGHT FLOW, 0.0741 HEAT INPUT, 9.75 INLET BULK TEMP, 74.0 OUTLET BULK TEMP, 103.3 PLOT CH K															
3.00	439.9	76.4	1.861	103.2	0.057	0.3742	307.	225.	0.00335	1.14	0.52	1.26	2.95	-0.033	1.16
4.00	439.7	77.3	1.785	107.6	0.059	0.4008	321.	237.	0.00373	1.25	0.60	1.40	3.07	-0.036	1.07
5.00	439.6	78.5	1.697	113.2	0.062	0.4334	353.	269.	0.00390	1.31	0.68	1.49	3.43	-0.037	0.92
5.75	439.5	79.6	1.622	118.4	0.065	0.4625	389.	305.	0.00386	1.28	0.73	1.49	3.84	-0.036	0.80
6.50	439.0	81.0	1.538	124.9	0.068	0.4970	471.	388.	0.00349	1.14	0.77	1.41	4.80	-0.031	0.62
7.25	438.4	82.7	1.447	132.7	0.072	0.5360	525.	441.	0.00337	1.06	0.81	1.36	5.34	-0.031	0.53
8.00	437.9	85.0	1.348	142.5	0.076	0.5805	817.	728.	0.00240	0.79	0.77	1.28	8.57	-0.021	0.32
8.75	437.3	87.6	1.252	153.3	0.080	0.6252	762.	675.	0.00243	0.77	0.76	1.16	7.70	-0.028	0.32
9.50	436.6	90.2	1.177	163.2	0.084	0.6615	605.	520.	0.00276	0.81	0.75	1.06	5.77	-0.044	0.38
10.25	435.9	92.4	1.118	171.7	0.087	0.6898	573.	490.	0.00254	0.71	0.68	0.90	5.31	-0.053	0.38
11.00	435.4	94.3	1.073	178.9	0.090	0.7119	487.	408.	0.00267	0.71	0.65	0.84	4.33	-0.073	0.43
12.00	435.0	96.5	1.028	186.8	0.093	0.7344	468.	392.	0.00231	0.59	0.55	0.69	4.06	-0.086	0.43
RUN 21- 797 WEIGHT FLOW, 0.1419 HEAT INPUT, 11.88 INLET BULK TEMP, 50.1 OUTLET BULK TEMP, 69.4 PLOT CH L															
3.00	402.4	53.5	3.904	98.6	0.031	0.0233	263.	136.	0.00780	1.72	1.05	1.79	2.54	0.199	3.79
4.00	401.4	54.6	3.838	100.3	0.033	0.0268	269.	139.	0.00897	2.05	1.17	2.13	2.54	0.180	3.71
5.00	400.7	55.9	3.758	102.4	0.034	0.0315	287.	156.	0.00921	2.43	1.22	2.56	2.79	0.139	3.55
5.75	400.0	57.0	3.686	104.4	0.036	0.0361	302.	168.	0.00940	2.67	1.24	2.83	2.95	0.114	3.41
6.50	399.2	58.2	3.601	106.9	0.038	0.0420	355.	222.	0.00763	2.64	1.12	2.89	3.82	0.070	3.12
7.25	398.4	59.5	3.503	109.9	0.041	0.0497	379.	247.	0.00731	2.59	1.07	2.90	4.15	0.054	2.89
8.00	397.6	61.0	3.379	113.9	0.044	0.0605	750.	621.	0.00339	1.26	0.77	2.02	10.18	0.015	1.89
8.75	396.7	62.5	3.235	119.0	0.049	0.0747	746.	617.	0.00329	1.17	0.69	1.89	9.88	0.013	1.68
9.50	395.5	63.7	3.107	123.9	0.053	0.0889	498.	375.	0.00457	1.53	0.69	1.95	5.88	0.019	1.96
10.25	394.3	64.7	3.001	128.2	0.057	0.1019	492.	371.	0.00407	1.32	0.58	1.69	5.73	0.015	1.83
11.00	393.6	65.4	2.910	132.3	0.061	0.1140	421.	299.	0.00447	1.42	0.54	1.70	4.57	0.017	1.91
12.00	393.3	66.2	2.810	137.0	0.065	0.1286	414.	296.	0.00379	1.16	0.44	1.39	4.47	0.014	1.80
RUN 22- 799 WEIGHT FLOW, 0.1177 HEAT INPUT, 11.59 INLET BULK TEMP, 49.0 OUTLET BULK TEMP, 70.5 PLOT CH M															
3.00	419.8	53.1	3.943	81.0	0.025	0.0220	255.	128.	0.00825	1.85	1.27	1.91	2.42	0.233	3.87
4.00	418.8	54.4	3.867	82.6	0.026	0.0260	263.	134.	0.00920	2.22	1.39	2.30	2.46	0.202	3.76
5.00	418.0	56.0	3.775	84.6	0.028	0.0315	283.	154.	0.00910	2.65	1.40	2.77	2.76	0.148	3.58
5.75	417.2	57.3	3.692	86.5	0.030	0.0370	301.	171.	0.00901	2.89	1.39	3.06	2.98	0.116	3.42
6.50	416.5	58.7	3.592	88.9	0.032	0.0443	373.	247.	0.00660	2.67	1.18	2.97	4.20	0.062	3.03
7.25	416.0	60.3	3.474	91.9	0.034	0.0541	450.	328.	0.00531	2.22	1.04	2.63	5.44	0.038	2.62
8.00	415.6	61.9	3.333	95.8	0.038	0.0673	621.	498.	0.00385	1.57	0.88	2.19	8.04	0.019	2.03
8.75	414.9	63.7	3.172	100.7	0.042	0.0849	812.	687.	0.00295	1.17	0.74	2.02	10.79	0.011	1.51
9.50	413.9	65.1	3.020	105.7	0.046	0.1036	515.	396.	0.00423	1.56	0.73	2.02	6.09	0.016	1.80
10.25	412.8	66.2	2.897	110.2	0.050	0.1206	506.	390.	0.00378	1.35	0.62	1.74	5.89	0.015	1.66
11.00	412.2	67.0	2.791	114.4	0.054	0.1367	449.	333.	0.00391	1.35	0.56	1.66	4.97	0.012	1.68
12.00	411.9	67.9	2.674	119.4	0.059	0.1562	429.	316.	0.00345	1.15	0.45	1.39	4.65	0.009	1.60
RUN 23- 801 WEIGHT FLOW, 0.1105 HEAT INPUT, 11.38 INLET BULK TEMP, 48.9 OUTLET BULK TEMP, 72.5 PLOT CH N															
3.00	450.5	53.2	3.966	75.6	0.023	0.0219	254.	124.	0.00849	1.75	1.37	1.80	2.34	0.264	3.91
4.00	449.6	54.6	3.889	77.1	0.024	0.0261	264.	134.	0.00899	2.11	1.44	2.19	2.46	0.217	3.79
5.00	448.7	56.3	3.794	79.0	0.026	0.0320	285.	156.	0.00878	2.54	1.44	2.65	2.77	0.157	3.61
5.75	447.9	57.6	3.709	80.8	0.027	0.0378	308.	177.	0.00843	2.74	1.41	2.90	3.06	0.119	3.43
6.50	447.4	59.2	3.608	83.1	0.029	0.0456	373.	246.	0.00650	2.60	1.23	2.87	4.15	0.068	3.07
7.25	447.0	60.8	3.488	85.9	0.031	0.0560	447.	323.	0.00527	2.20	1.08	2.58	5.32	0.042	2.62
8.00	446.8	62.6	3.346	89.6	0.035	0.0701	620.	497.	0.00377	1.56	0.91	2.13	7.93	0.021	2.06
8.75	446.2	64.5	3.179	94.3	0.039	0.0893	879.	752.	0.00272	1.13	0.76	2.00	11.66	0.011	1.65
9.50	445.3	66.1	3.022	99.2	0.043	0.1099	522.	403.	0.00407	1.52	0.75	1.94	6.10	0.017	1.79
10.25	444.4	67.2	2.898	103.4	0.046	0.1281	511.	394.	0.00367	1.32	0.64	1.68	5.86	0.014	1.66
11.00	443.9	68.2	2.791	107.4	0.050	0.1453	453.	336.	0.00380	1.31	0.59	1.60	4.93	0.013	1.68
12.00	443.7	69.2	2.674	112.1	0.054	0.1660	435.	321.	0.00333	1.11	0.48	1.33	4.64	0.010	1.59
RUN 24- 802 WEIGHT FLOW, 0.1202 HEAT INPUT, 11.35 INLET BULK TEMP, 67.3 OUTLET BULK TEMP, 81.5 PLOT CH J															
3.00	410.5	69.0	2.521	129.3	0.067	0.1846	322.	202.	0.00486	1.35	0.48	1.49	2.92	0.009	1.85
4.00	409.3	69.6	2.436	133.8	0.070	0.2018	330.	207.	0.00554	1.52	0.54	1.69	2.97	0.004	1.73
5.00	408.3	70.2	2.337	139.5	0.075	0.2235	348.	222.	0.00508	1.68	0.60	1.89	3.16	-0.001	1.57
5.75	407.4	70.8	2.252	144.7	0.079	0.2433	355.	227.	0.00667	1.81	0.67	2.04	3.21	-0.005	1.47
6.50	406.9	71.5	2.158	151.1	0.083	0.2670	425.	300.	0.00553	1.54	0.64	1.85	4.19	-0.007	1.16
7.25	406.7	72.4	2.055	158.7	0.089	0.2950	463.	340.	0.00522	1.40	0.65	1.75	4.70	-0.009	0.99
8.00	406.6	73.4	1.942	167.9	0.095	0.3284	665.	540.	0.00362	0.94	0.58	1.43	7.36	-0.007	0.65
8.75	405.5	74.4	1.828	178.3	0.101	0.3644	577.	453.	0.00403	0.99	0.59	1.37	6.09	-0.012	0.68
9.50	403.5	75.3	1.729	188.5	0.107	0.3976	517.	396.	0.00425	1.02	0.59	1.32	5.26	-0.017	0.69
10.25	401.6	76.2	1.647	197.9	0.113	0.4271	501.	383.	0.00386	0.90	0.53	1.15	5.03	-0.021	0.67
11.00	400.4	77.0	1.581	206.1	0.117	0.4520	432.	313.	0.00423	0.96	0.53	1.14	4.07	-0.031	0.74
12.00	399.9	78.0	1.514	215.3	0.122	0.4791	426.	310.	0.00357	0.79	0.45	0.93	3.98	-0.036	0.71
RUN 25- 803 WEIGHT FLOW, 0.1016 HEAT INPUT, 11.12 INLET BULK TEMP, 66.8 OUTLET BULK TEMP, 83.7 PLOT CH P															
3.00	357.3	68.2	2.248	122.6	0.070	0.2203	313.	201.	0.00448	1.46	0.46	1.64	2.94	-0.003	1.55
4.00	356.4	68.7	2.156	127.8	0.074	0.2414	326.	212.	0.00493	1.61	0.52	1.82	3.08	-0.007	1.42
5.00	355.7	69.4	2.050												

FLUX-GRADIENT (SUPERCRITICAL) RUNS

RE-B	RE-F	RE-F,MN	PR-B	PR-F	XTTF	VIS-RAT	PHI-B	PHI-F	EFLUX	DDDL	H/H-H	SIMPLE	NU/NUT	TOLK
HEAT BALANCE,-0.10 TEST VOLTAGE, 9.3 HEAT INPUT/UNIT AREA, 1.236 ID, 0.260 OD, 0.370 LENGTH, 16.0														
2140765.	531610.	1220421.	1.319	0.608	0.7517	8.021	0.4838	0.3250	0.00454	0.53	0.540	92.8	0.67	1.33
2190940.	524177.	1156408.	1.274	0.613	0.6689	8.390	0.4799	0.3276	0.00522	0.63	0.629	91.5	0.78	1.34
2245036.	475505.	1009551.	1.213	0.627	0.5660	9.747	0.4732	0.3363	0.00608	0.78	0.726	87.4	0.88	1.41
2287710.	437493.	895470.	1.152	0.638	0.4898	11.050	0.4657	0.3452	0.00665	0.90	0.791	84.0	0.94	1.48
2333224.	322140.	640709.	1.079	0.666	0.3845	16.386	0.4556	0.3798	0.00716	1.11	0.809	74.5	0.90	1.75
2377912.	289499.	544430.	0.998	0.673	0.3182	19.165	0.4431	0.3929	0.00728	1.24	0.835	71.0	0.71	1.70
2417155.	151310.	272624.	0.912	0.678	0.2146	41.934	0.4285	0.4173	0.00724	1.55	0.766	56.1	0.84	2.54
2444672.	216159.	359619.	0.838	0.680	0.2044	28.399	0.4141	0.4132	0.00644	1.37	0.754	62.8	0.83	2.30
2459528.	274679.	429886.	0.786	0.680	0.1921	21.714	0.4026	0.4102	0.00567	1.21	0.718	67.8	0.79	2.15
2466018.	309649.	463550.	0.748	0.679	0.1776	18.958	0.3934	0.4081	0.00473	1.03	0.630	70.4	0.70	2.10
2466789.	410665.	590725.	0.721	0.671	0.1776	13.245	0.3861	0.3868	0.00410	0.86	0.596	77.6	0.69	1.45
2463139.	448203.	623714.	0.696	0.669	0.1653	11.904	0.3787	0.3831	0.00328	0.70	0.497	79.9	0.58	1.82
HEAT BALANCE,-0.07 TEST VOLTAGE, 9.3 HEAT INPUT/UNIT AREA, 1.207 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1874451.	495928.	1029585.	1.177	0.607	0.6499	7.415	0.4642	0.3305	0.00454	0.50	0.571	83.7	0.71	1.36
1911189.	480411.	961044.	1.128	0.614	0.5738	7.898	0.4586	0.3343	0.00519	0.60	0.659	82.0	0.81	1.39
1949967.	424264.	818766.	1.066	0.630	0.4800	9.448	0.4504	0.3453	0.00602	0.74	0.749	77.6	0.90	1.47
1979596.	372793.	696209.	1.009	0.646	0.4079	11.289	0.4422	0.3599	0.00651	0.87	0.737	73.4	0.93	1.59
2009188.	280399.	506877.	0.945	0.668	0.3223	16.232	0.4319	0.3908	0.00699	1.07	0.820	65.6	0.91	1.87
2035491.	247243.	423912.	0.878	0.676	0.2649	19.593	0.4201	0.4066	0.00709	1.21	0.840	62.2	0.91	2.58
2055837.	126762.	208223.	0.810	0.682	0.1776	42.510	0.4068	0.4130	0.00720	1.54	0.782	49.1	0.89	2.66
2066184.	152460.	233475.	0.752	0.677	0.1582	35.011	0.3938	0.4173	0.00639	1.43	0.742	51.8	0.84	2.60
2067157.	234842.	338420.	0.712	0.679	0.1582	21.347	0.3835	0.4138	0.00548	1.19	0.716	59.8	0.81	2.29
2063008.	266491.	369187.	0.685	0.678	0.1468	18.384	0.3756	0.4126	0.00456	1.01	0.627	62.4	0.71	2.23
2056276.	355440.	475551.	0.666	0.674	0.1474	12.789	0.3694	0.4001	0.00392	0.84	0.590	69.1	0.68	2.01
2045835.	389230.	506020.	0.648	0.672	0.1377	11.304	0.3632	0.3960	0.00313	0.68	0.492	71.4	0.57	1.97
HEAT BALANCE,-0.19 TEST VOLTAGE, 10.0 HEAT INPUT/UNIT AREA, 1.371 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1316102.	1026639.	3999745.	1.215	0.646	15.8251	2.658	0.2847	0.3610	0.00445	0.64	0.659	158.1	0.41	1.77
1374836.	996075.	3950558.	1.222	0.632	13.6120	2.834	0.2935	0.3551	0.00530	0.75	0.741	158.0	0.48	1.75
1448413.	847587.	3731370.	1.234	0.599	10.8539	3.527	0.3044	0.3359	0.00665	0.92	0.759	150.8	0.54	1.71
1516925.	765140.	3553648.	1.247	0.591	9.1023	4.116	0.3145	0.3286	0.00765	1.05	0.787	146.5	0.59	1.69
1601280.	523276.	2944449.	1.264	0.602	6.7656	6.707	0.3268	0.3210	0.00928	1.25	0.765	128.9	0.56	1.65
1703332.	458508.	2663772.	1.286	0.615	5.4523	8.285	0.3414	0.3266	0.0102	1.37	0.795	123.5	0.59	1.73
1839104.	121783.	1074325.	1.318	0.680	2.8144	41.062	0.3605	0.4160	0.01117	1.90	0.704	78.9	0.41	2.13
2005746.	127471.	999112.	1.361	0.680	2.2926	42.592	0.3832	0.4159	0.01041	1.83	0.670	80.1	0.42	2.15
2161390.	276904.	1617877.	1.401	0.667	2.4820	18.780	0.4035	0.3787	0.00903	1.42	0.669	103.9	0.50	1.73
2295380.	289198.	1571240.	1.434	0.666	2.1695	18.987	0.4199	0.3778	0.00776	1.25	0.587	105.2	0.46	1.72
2412907.	403970.	1900448.	1.461	0.643	2.1501	13.540	0.4335	0.3458	0.00673	1.04	0.551	117.8	0.48	1.56
2544728.	423151.	1864477.	1.492	0.642	1.9059	13.544	0.4480	0.3457	0.00547	0.87	0.461	119.2	0.42	1.54
HEAT BALANCE,-0.08 TEST VOLTAGE, 10.0 HEAT INPUT/UNIT AREA, 1.423 ID, 0.260 OD, 0.370 LENGTH, 16.0														
1062384.	955945.	3335252.	1.209	0.691	17.7882	2.308	0.2796	0.3775	0.00489	0.62	0.831	139.4	0.48	1.73
1117459.	897363.	3286417.	1.216	0.657	14.6627	2.554	0.2894	0.3659	0.00590	0.73	0.896	138.2	0.56	1.77
1187068.	736220.	3089892.	1.227	0.604	11.1605	3.319	0.3018	0.3408	0.00751	0.90	0.877	130.6	0.62	1.73
1252450.	643973.	2908479.	1.240	0.591	9.0214	4.037	0.3133	0.3310	0.00869	1.02	0.885	125.6	0.66	1.69
1334245.	388445.	2253356.	1.258	0.612	6.2316	7.679	0.3275	0.3286	0.01055	1.24	0.837	105.7	0.59	1.65
1436983.	264736.	1735226.	1.283	0.650	4.4433	12.861	0.3449	0.3593	0.01158	1.42	0.843	92.9	0.56	1.70
1565603.	148251.	1101171.	1.316	0.679	2.9039	27.583	0.3660	0.4108	0.01197	1.68	0.799	76.4	0.50	1.95
1723282.	95489.	708152.	1.357	0.678	1.9574	49.404	0.3907	0.4172	0.01165	1.84	0.734	66.0	0.47	2.28
1878224.	226092.	1223867.	1.395	0.669	2.1170	20.088	0.4131	0.3868	0.00990	1.40	0.734	87.9	0.56	1.78
2009083.	239795.	1188018.	1.423	0.668	1.8221	20.109	0.4304	0.3852	0.00845	1.22	0.645	89.3	0.52	1.75
2123674.	309953.	1354809.	1.448	0.655	1.7258	15.806	0.4447	0.3643	0.00733	1.04	0.597	97.2	0.52	1.63
2251379.	347384.	1382888.	1.484	0.649	1.5351	14.696	0.4605	0.3571	0.00593	0.86	0.506	100.5	0.47	1.58
HEAT BALANCE,-0.11 TEST VOLTAGE, 10.0 HEAT INPUT/UNIT AREA, 1.383 ID, 0.260 OD, 0.370 LENGTH, 16.0														
980444.	992887.	3073928.	1.205	0.746	19.0378	2.046	0.2766	0.3920	0.00457	0.60	0.921	134.8	0.51	1.81
1032311.	887968.	3028162.	1.209	0.673	15.1707	2.380	0.2863	0.3720	0.00575	0.72	0.939	131.5	0.57	1.78
1098146.	720385.	2854406.	1.218	0.608	11.3661	3.132	0.2987	0.3452	0.00736	0.87	0.905	123.8	0.63	1.74
1160022.	609993.	2659513.	1.228	0.591	8.9984	3.956	0.3101	0.3346	0.00857	1.00	0.893	117.8	0.66	1.71
1237062.	389388.	2120162.	1.243	0.608	6.3011	7.052	0.3241	0.3323	0.01040	1.21	0.857	101.2	0.61	1.88
1333435.	269567.	1453691.	1.262	0.645	4.4874	11.594	0.3411	0.3603	0.01131	1.38	0.862	89.4	0.58	1.71
1453948.	148864.	1044675.	1.288	0.677	2.9006	25.351	0.3616	0.4122	0.01158	1.64	0.814	73.2	0.51	1.97
1604879.	82808.	597154.	1.320	0.683	1.8440	53.161	0.3857	0.4127	0.01161	1.87	0.746	60.4	0.48	2.35
1753452.	220727.	1129388.	1.346	0.668	2.0544	19.228	0.4071	0.3911	0.00964	1.37	0.743	83.5	0.57	1.81
1875556.	236530.	1103797.	1.362	0.667	1.7705	18.936	0.4229	0.3888	0.00822	1.20	0.653	85.2	0.52	1.79
1981819.	306741.	1261507.	1.376	0.652	1.6772	14.800	0.4357	0.3685	0.00713	1.02	0.605	92.9	0.53	1.66
2099789.	339822.	1276595.	1.397	0.648	1.4846	13.940	0.4496	0.3626	0.00577	0.84	0.511	95.7	0.48	1.61
HEAT BALANCE,-0.10 TEST VOLTAGE, 9.9 HEAT INPUT/UNIT AREA, 1.397 ID, 0.260 OD, 0.370 LENGTH, 16.0														
2472290.	692575.	2148651.	1.544	0.597	1.5917	7.094	0.4815	0.3229	0.00456	0.64	0.494	129.1	0.56	1.36
2568502.	688001.	2062440.	1.563	0.599	1.4173	7.451	0.4905	0.3225	0.00527	0.76	0.576	127.9	0.66	1.35
2679234.	647061.	1881436.	1.546	0.606	1.2131	8.413	0.4954	0.3236	0.00619	0.92	0.672	124.0	0.78	1.35
2772132.	647338.	1805979.	1.506	0.609	1.0831	8.732	0.4954	0.3252	0.00630	1.04	0.752	123.1	0.88	1.35
2872590.	460922.	1298867.	1.450	0.644	0.8445	13.717	0.4931	0.3511	0.00748	1.26	0.765	107.7	0.93	1.52
2977755.	404273.	1089106.	1.392	0.659	0.7006	16.706	0.4899	0.3690	0.00766	1.40	0.783	101.8	0.83	1.64
3087215.	218975.	580580.	1.330	0.680	0.4844	36.212	0.4857	0.4128	0.00749	1.69	0.709	81.3	0.70	2.21
3191328.	298356.	712666.	1.261	0.678	0.4581	26.414	0.4794	0.4059	0.00686	1.53	0.709	89.3	0.72	2.02
3276837.	379633.	833111.	1.191	0.672	0.4310	20.131	0.4714	0.3891	0.00618	1.36	0.689	96.2	0.74	1.85
3343265.	414831.	856898.	1.124	0.670	0.3926	18.583	0.4628	0.3854	0.00525	1.19	0.613	98.4	0.67	1.71
3391478.	569089.	1100295.	1.067	0.652	0.3955	12.965	0.4546	0.3587	0.00463	1.00	0.595	109.4	0.69	1.58
3434624.	598487.	1104069.	1.006	0.652	0.3609	12.399	0.4451	0.3578	0.00373	0.83	0.499	110.6	0.58	1.58
HEAT BALANCE,-0.10 TEST VOLTAGE, 10.0 HEAT INPUT/UNIT AREA, 1.417 ID, 0.260 OD, 0.370 LENGTH, 16.0														
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TABLE VII. - Continued. AMBIENT TEMPERATURE GASEOUS RUNS

RUN	OMEGA	BIGQ	SMALLQ	OD	ID	ELT	TIN	VTEST	HEAT	BAL		
7	963	0.040	10.48	0.7393	0.2500	0.1880	24.0	530.	22.70	0.02		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	475.2	537.5	0.166	1268.	0.29	656.	601.	0.01171	1.28	1.11	1.15	1.12
4.50	470.0	543.8	0.162	1296.	0.29	674.	620.	0.00972	1.07	0.93	0.97	1.14
6.50	464.3	550.1	0.158	1326.	0.30	681.	626.	0.00970	1.06	0.93	0.96	1.14
8.50	459.2	556.3	0.155	1354.	0.31	693.	639.	0.00898	0.99	0.86	0.90	1.15
9.50	456.5	559.4	0.153	1369.	0.31	693.	639.	0.00930	1.02	0.89	0.93	1.14
10.50	454.0	562.5	0.152	1384.	0.31	690.	636.	0.01002	1.09	0.95	0.99	1.13
11.50	451.0	565.6	0.150	1400.	0.31	701.	647.	0.00908	0.99	0.87	0.90	1.14
13.50	446.0	571.8	0.147	1430.	0.32	708.	654.	0.00897	0.98	0.85	0.99	1.14
15.50	440.3	578.0	0.144	1463.	0.32	711.	658.	0.00925	1.01	0.88	0.92	1.14
17.50	435.2	584.3	0.141	1494.	0.33	717.	664.	0.00926	1.01	0.87	0.92	1.14
19.50	430.0	590.5	0.138	1527.	0.34	708.	654.	0.01160	1.25	1.08	1.14	1.11
21.50	424.3	596.6	0.135	1562.	0.34	727.	674.	0.00955	1.04	0.90	0.95	1.13
8	964	0.041	6.32	0.4459	0.2500	0.1880	24.0	528.	17.70	-0.01		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	473.0	532.4	0.167	1271.	0.29	600.	566.	0.01324	1.42	1.22	1.27	1.06
4.50	468.0	536.1	0.164	1292.	0.30	612.	578.	0.01071	1.15	0.99	1.03	1.08
6.50	463.3	539.9	0.161	1314.	0.30	616.	583.	0.01044	1.12	0.97	1.00	1.08
8.50	458.0	543.6	0.158	1337.	0.30	623.	589.	0.00985	1.06	0.91	0.95	1.08
9.50	456.0	545.5	0.157	1347.	0.31	623.	590.	0.01013	1.09	0.94	0.98	1.08
10.50	453.7	547.4	0.156	1358.	0.31	620.	587.	0.01135	1.22	1.04	1.09	1.07
11.50	451.0	549.3	0.154	1370.	0.31	627.	594.	0.01004	1.08	0.93	0.97	1.08
13.50	446.0	553.0	0.152	1394.	0.32	633.	600.	0.00953	1.03	0.88	0.92	1.08
15.50	441.2	556.7	0.149	1417.	0.32	634.	601.	0.01016	1.09	0.94	0.98	1.08
17.50	436.3	560.4	0.147	1442.	0.32	638.	605.	0.01008	1.08	0.93	0.97	1.08
19.50	431.5	564.2	0.144	1466.	0.33	649.	616.	0.00862	0.93	0.80	0.83	1.09
21.50	426.3	567.9	0.142	1492.	0.33	646.	612.	0.01000	1.07	0.92	0.96	1.08
9	965	0.038	4.87	0.3436	0.2500	0.1880	24.0	529.	15.90	-0.11		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	287.5	531.2	0.105	1891.	0.44	586.	560.	0.01190	1.38	1.17	1.20	1.05
4.50	280.0	534.0	0.102	1947.	0.46	596.	570.	0.00963	1.12	0.95	0.97	1.07
6.50	271.7	536.9	0.098	2011.	0.47	598.	572.	0.00973	1.14	0.96	0.98	1.07
8.50	263.3	539.6	0.095	2079.	0.49	605.	579.	0.00867	1.02	0.86	0.88	1.07
9.50	259.0	541.0	0.093	2115.	0.49	606.	580.	0.00877	1.03	0.87	0.89	1.07
10.50	255.0	542.4	0.092	2150.	0.50	603.	577.	0.01005	1.18	0.99	1.01	1.06
11.50	250.3	543.7	0.090	2191.	0.51	609.	583.	0.00882	1.04	0.87	0.89	1.07
13.50	241.7	546.2	0.087	2271.	0.53	612.	586.	0.00855	1.01	0.84	0.87	1.07
15.50	232.3	548.6	0.084	2361.	0.55	615.	589.	0.00853	1.01	0.84	0.86	1.07
17.50	222.3	557.4	0.079	2491.	0.58	619.	593.	0.00969	1.15	0.95	0.98	1.06
19.50	211.3	560.8	0.075	2618.	0.61	602.	576.	0.02331	2.74	2.24	2.31	1.03
21.50	199.0	564.5	0.071	2772.	0.65	620.	594.	0.01156	1.38	1.13	1.16	1.05
10	967	0.037	9.68	0.6829	0.2500	0.1880	24.0	524.	21.80	0.01		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	288.0	529.6	0.105	1828.	0.43	643.	592.	0.01099	1.33	1.14	1.17	1.12
4.50	280.3	535.8	0.101	1895.	0.44	660.	610.	0.00923	1.13	0.97	0.99	1.14
6.50	272.5	541.9	0.097	1965.	0.46	664.	614.	0.00951	1.16	0.99	1.02	1.13
8.50	264.5	548.0	0.094	2041.	0.47	679.	629.	0.00840	1.03	0.88	0.90	1.15
9.50	260.0	551.0	0.092	2083.	0.48	681.	631.	0.00854	1.04	0.89	0.92	1.15
10.50	256.0	553.9	0.090	2124.	0.49	676.	626.	0.00951	1.16	0.98	1.01	1.13
11.50	252.0	556.9	0.088	2165.	0.50	687.	637.	0.00854	1.04	0.89	0.92	1.14
13.50	243.5	562.7	0.085	2255.	0.52	695.	645.	0.00828	1.02	0.86	0.89	1.15
15.50	234.3	568.4	0.081	2355.	0.54	697.	647.	0.00864	1.06	0.90	0.93	1.14
17.50	224.7	573.8	0.078	2466.	0.57	705.	655.	0.00839	1.03	0.87	0.90	1.14
19.50	214.3	586.6	0.073	2623.	0.60	722.	674.	0.00785	0.97	0.81	0.84	1.15
21.50	202.0	593.5	0.069	2790.	0.63	713.	664.	0.00975	1.20	1.00	1.03	1.12
11	968	0.036	14.13	0.9968	0.2500	0.1880	24.0	526.	26.60	-0.00		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	295.5	535.7	0.106	1786.	0.42	703.	630.	0.01054	1.31	1.13	1.16	1.18
4.50	287.7	544.9	0.102	1861.	0.43	726.	654.	0.00914	1.14	0.99	1.01	1.20
6.50	279.5	554.0	0.098	1942.	0.45	732.	661.	0.00934	1.16	1.00	1.03	1.19
8.50	261.0	562.8	0.090	2098.	0.48	754.	683.	0.00776	1.03	0.89	0.92	1.21
9.50	266.7	567.6	0.091	2074.	0.47	756.	686.	0.00841	1.05	0.91	0.94	1.21
10.50	262.5	572.0	0.089	2120.	0.48	752.	681.	0.00915	1.13	0.98	1.01	1.19
11.50	258.0	576.5	0.087	2169.	0.49	766.	696.	0.00832	1.04	0.89	0.93	1.21
13.50	249.5	585.2	0.084	2267.	0.51	774.	705.	0.00835	1.04	0.89	0.93	1.20
15.50	240.0	593.8	0.080	2380.	0.53	778.	709.	0.00869	1.08	0.92	0.96	1.19
17.50	229.7	602.1	0.076	2506.	0.56	788.	719.	0.00852	1.06	0.90	0.94	1.19
19.50	218.5	618.0	0.071	2683.	0.60	838.	771.	0.00653	0.83	0.71	0.74	1.25
21.50	205.6	627.9	0.066	2869.	0.63	805.	737.	0.00916	1.14	0.96	1.01	1.17
12	969	0.036	19.34	1.3644	0.2500	0.1880	24.0	526.	31.80	0.02		
EL	PB	TB	ROB	VELOC	M	TD	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	301.0	540.9	0.107	1745.	0.40	767.	671.	0.01048	1.33	1.17	1.20	1.24
4.50	293.0	543.8	0.102	1830.	0.42	801.	707.	0.00890	1.14	1.00	1.03	1.28
6.50	284.3	546.5	0.097	1923.	0.44	808.	714.	0.00925	1.18	1.03	1.07	1.26
8.50	275.7	549.2	0.092	2021.	0.46	835.	743.	0.00832	1.06	0.93	0.97	1.28
9.50	271.5	555.5	0.090	2070.	0.46	840.	747.	0.00843	1.07	0.94	0.98	1.28
10.50	266.5	561.7	0.088	2127.	0.48	833.	741.	0.00915	1.16	1.01	1.05	1.25
11.50	262.2	567.9	0.085	2180.	0.49	853.	766.	0.00810	1.03	0.90	0.94	1.28
13.50	253.3	576.3	0.081	2293.	0.51	864.	777.	0.00819	1.04	0.91	0.95	1.27
15.50	243.3	582.4	0.077	2422.	0.53	874.	788.	0.00823	1.05	0.91	0.95	1.27
17.50	232.5	588.2	0.073	2566.	0.56	880.	802.	0.00813	1.03	0.89	0.94	1.26
19.50	221.0	594.1	0.067	2761.	0.60	840.	748.	0.01452	1.79	1.50	1.59	1.14
21.50	208.0	601.6	0.063	2965.	0.64	906.	821.	0.00887	1.12	0.95	1.01	1.23

TABLE VII. - Continued. AMBIENT TEMPERATURE GASEOUS RUNS

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL		
13 970	0.026	7.28	0.5136	0.2500	0.1880	24.0	530.	19.20	0.03			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	314.0	538.1	0.110	1226.	0.28	640.	601.	0.00811	1.27	1.10	1.14	1.12
4.50	310.0	544.9	0.107	1257.	0.29	655.	617.	0.00713	1.12	0.97	1.01	1.13
6.50	307.0	551.7	0.105	1284.	0.29	658.	620.	0.00752	1.18	1.02	1.06	1.12
8.50	303.5	558.4	0.103	1314.	0.30	674.	636.	0.00663	1.04	0.90	0.94	1.14
9.50	301.7	561.8	0.101	1329.	0.30	677.	639.	0.00666	1.05	0.91	0.94	1.14
10.50	300.0	565.2	0.100	1344.	0.30	679.	635.	0.00737	1.15	0.99	1.04	1.12
11.50	298.0	568.5	0.099	1360.	0.31	689.	645.	0.00672	1.05	0.91	0.95	1.13
13.50	295.0	575.3	0.097	1389.	0.31	689.	652.	0.00670	1.05	0.91	0.95	1.13
15.50	291.5	582.0	0.095	1421.	0.32	694.	656.	0.00692	1.08	0.93	0.98	1.13
17.50	288.0	588.7	0.093	1454.	0.32	700.	663.	0.00689	1.07	0.92	0.97	1.11
19.50	284.5	595.4	0.091	1487.	0.33	726.	690.	0.00544	0.85	0.74	0.78	1.16
21.50	281.0	602.2	0.089	1521.	0.33	701.	664.	0.00836	1.29	1.10	1.17	1.10

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL		
14 971	0.026	13.27	0.9362	0.2500	0.1880	24.0	531.	25.90	0.09			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	329.5	545.9	0.114	1174.	0.27	732.	665.	0.00786	1.27	1.13	1.16	1.22
4.50	326.0	558.3	0.110	1213.	0.27	761.	696.	0.00682	1.11	0.98	1.02	1.25
6.50	322.0	570.8	0.106	1254.	0.28	768.	703.	0.00709	1.05	1.01	1.05	1.23
8.50	318.5	583.2	0.103	1294.	0.29	794.	729.	0.00640	1.04	0.92	0.96	1.25
9.50	316.8	589.4	0.101	1314.	0.29	798.	734.	0.00648	1.05	0.93	0.97	1.24
10.50	315.0	595.6	0.100	1335.	0.29	793.	729.	0.00703	1.13	0.99	1.04	1.22
11.50	313.0	601.8	0.098	1357.	0.30	811.	747.	0.00645	1.04	0.92	0.96	1.24
13.50	309.7	614.2	0.095	1398.	0.30	822.	759.	0.00648	1.04	0.91	0.97	1.24
15.50	306.0	626.7	0.092	1442.	0.31	829.	766.	0.00673	1.07	0.94	1.00	1.22
17.50	302.3	639.1	0.090	1487.	0.32	842.	779.	0.00668	1.06	0.93	0.99	1.22
19.50	298.5	651.4	0.087	1534.	0.32	841.	778.	0.00738	1.15	1.01	1.08	1.19
21.50	295.0	663.8	0.084	1579.	0.33	858.	799.	0.00692	1.08	0.95	1.02	1.20

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL		
15 972	0.025	6.78	0.4783	0.2500	0.1880	24.0	527.	18.40	0.09			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	444.0	535.3	0.154	844.	0.19	629.	592.	0.00836	1.33	1.16	1.20	1.11
4.50	442.0	541.9	0.152	858.	0.20	643.	608.	0.00726	1.16	1.01	1.05	1.12
6.50	440.0	548.4	0.149	872.	0.20	648.	613.	0.00764	1.18	1.03	1.07	1.12
8.50	439.0	554.9	0.147	886.	0.20	661.	625.	0.00678	1.08	0.94	0.98	1.13
9.50	437.0	558.2	0.146	894.	0.20	662.	627.	0.00695	1.10	0.96	1.01	1.12
10.50	436.0	561.4	0.145	901.	0.20	660.	624.	0.00761	1.20	1.05	1.10	1.11
11.50	435.0	564.7	0.143	908.	0.20	669.	634.	0.00687	1.09	0.95	1.00	1.12
13.50	433.0	571.2	0.141	922.	0.20	677.	642.	0.00675	1.07	0.93	0.98	1.12
15.50	431.0	577.7	0.139	937.	0.21	679.	644.	0.00723	1.14	0.99	1.04	1.11
17.50	428.5	584.2	0.137	952.	0.21	685.	650.	0.00730	1.15	1.00	1.05	1.11
19.50	426.5	590.7	0.135	967.	0.21	703.	669.	0.00611	0.96	0.84	0.89	1.13
21.50	424.5	597.2	0.133	982.	0.21	698.	664.	0.00721	1.13	0.98	1.04	1.11

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL		
16 973	0.025	12.99	0.9164	0.2500	0.1880	24.0	524.	25.60	0.16			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	416.0	540.2	0.143	897.	0.20	728.	662.	0.00753	1.25	1.11	1.15	1.23
4.50	413.5	552.9	0.139	923.	0.21	759.	694.	0.00648	1.08	0.97	1.00	1.26
6.50	411.0	565.5	0.136	949.	0.21	770.	706.	0.00650	1.08	0.96	1.00	1.25
8.50	408.5	578.1	0.132	976.	0.22	791.	728.	0.00612	1.01	0.91	0.95	1.26
9.50	407.3	584.4	0.130	989.	0.22	795.	732.	0.00619	1.02	0.91	0.96	1.25
10.50	406.0	590.7	0.128	1002.	0.22	790.	727.	0.00674	1.10	0.98	1.03	1.23
11.50	404.3	597.0	0.127	1017.	0.22	807.	744.	0.00622	1.02	0.91	0.96	1.25
13.50	402.0	609.7	0.123	1044.	0.22	820.	758.	0.00619	1.01	0.90	0.95	1.24
15.50	399.3	622.3	0.120	1072.	0.23	828.	766.	0.00636	1.03	0.92	0.97	1.23
17.50	396.7	634.9	0.117	1100.	0.23	836.	775.	0.00654	1.05	0.93	1.00	1.22
19.50	394.0	647.5	0.114	1129.	0.24	881.	824.	0.00519	0.85	0.76	0.81	1.27
21.50	391.7	660.1	0.111	1157.	0.24	859.	801.	0.00649	1.04	0.92	0.99	1.21

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL		
17 974	0.024	12.47	0.8797	0.2500	0.1880	24.0	524.	25.20	0.24			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB
2.50	402.5	539.3	0.139	913.	0.21	721.	658.	0.00743	1.25	1.11	1.14	1.22
4.50	400.0	551.7	0.135	940.	0.21	751.	689.	0.00643	1.08	0.96	1.00	1.25
6.50	398.0	563.9	0.132	965.	0.22	760.	698.	0.00654	1.09	0.97	1.01	1.24
8.50	395.2	576.2	0.128	992.	0.22	780.	719.	0.00617	1.03	0.92	0.96	1.25
9.50	394.0	582.3	0.126	1005.	0.22	785.	724.	0.00622	1.03	0.92	0.97	1.24
10.50	392.5	588.5	0.125	1019.	0.22	780.	719.	0.00672	1.11	0.98	1.04	1.22
11.50	391.3	594.6	0.123	1033.	0.23	796.	736.	0.00623	1.03	0.92	0.97	1.24
13.50	389.0	606.9	0.120	1060.	0.23	806.	746.	0.00631	1.04	0.92	0.98	1.23
15.50	386.3	619.1	0.117	1088.	0.23	814.	755.	0.00649	1.06	0.94	1.00	1.22
17.50	384.0	631.4	0.114	1116.	0.24	824.	765.	0.00660	1.07	0.95	1.01	1.21
19.50	381.2	643.6	0.111	1145.	0.24	817.	757.	0.00773	1.24	1.09	1.17	1.18
21.50	378.8	655.9	0.108	1173.	0.24	845.	787.	0.00673	1.08	0.95	1.03	1.20

TABLE VII. - Concluded. AMBIENT TEMPERATURE GASEOUS RUNS

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL			
1	1163	0.031	11.67	0.3054	0.5272	0.5068	24.0	505.	28.50	0.02			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB	
2.50	214.0	516.5	0.077	283.	0.07	744.	737.	0.00138	1.24	1.14	1.15	1.43	
4.50	214.0	525.8	0.076	288.	0.07	770.	763.	0.00129	1.15	1.06	1.08	1.45	
6.50	214.0	535.1	0.075	293.	0.07	783.	776.	0.00127	1.13	1.04	1.06	1.45	
8.50	214.0	544.4	0.073	298.	0.07	814.	807.	0.00116	1.04	0.96	0.99	1.48	
9.50	214.0	549.0	0.073	301.	0.07	829.	822.	0.00112	1.00	0.93	0.95	1.50	
10.50	214.0	553.6	0.072	303.	0.07	842.	835.	0.00109	0.97	0.90	0.93	1.51	
11.50	214.0	558.2	0.071	306.	0.07	841.	834.	0.00111	0.99	0.92	0.94	1.49	
13.50	214.0	567.4	0.070	311.	0.07	855.	848.	0.00109	0.97	0.90	0.93	1.49	
15.50	214.0	576.7	0.069	316.	0.07	860.	854.	0.00110	0.97	0.90	0.93	1.48	
17.50	214.0	585.9	0.068	321.	0.07	867.	860.	0.00111	0.98	0.90	0.94	1.47	
19.50	214.0	595.1	0.067	326.	0.07	876.	869.	0.00111	0.97	0.90	0.94	1.46	
21.50	214.0	604.3	0.066	331.	0.07	877.	871.	0.00115	0.99	0.91	0.96	1.44	

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL			
2	1162	0.031	12.21	0.3195	0.5272	0.5068	24.0	503.	29.00	0.02			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB	
2.50	276.0	515.2	0.100	219.	0.05	748.	741.	0.00142	1.27	1.17	1.18	1.44	
4.50	276.0	524.9	0.098	224.	0.05	772.	765.	0.00133	1.19	1.10	1.12	1.46	
6.50	276.0	534.7	0.096	228.	0.05	791.	783.	0.00128	1.15	1.06	1.08	1.47	
8.50	276.0	544.4	0.094	232.	0.05	813.	805.	0.00123	1.09	1.01	1.04	1.48	
9.50	276.0	549.2	0.093	234.	0.05	844.	836.	0.00111	1.00	0.93	0.95	1.52	
10.50	276.0	554.0	0.093	236.	0.05	843.	836.	0.00113	1.01	0.94	0.97	1.51	
11.50	276.0	558.9	0.092	238.	0.05	860.	853.	0.00109	0.97	0.91	0.93	1.53	
13.50	276.0	568.5	0.090	242.	0.05	853.	846.	0.00115	1.02	0.94	0.98	1.49	
15.50	276.0	578.1	0.089	246.	0.05	873.	866.	0.00111	0.98	0.91	0.94	1.50	
17.50	276.0	587.8	0.087	250.	0.05	868.	861.	0.00117	1.02	0.94	0.98	1.46	
19.50	276.0	597.4	0.086	254.	0.06	881.	874.	0.00115	1.00	0.93	0.97	1.46	
21.50	276.0	607.0	0.085	258.	0.06	882.	875.	0.00119	1.03	0.95	1.00	1.44	

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL			
3	1160	0.041	8.53	0.2232	0.5272	0.5068	24.0	504.	24.50	0.10			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB	
2.50	415.0	510.3	0.150	195.	0.05	633.	628.	0.00190	1.27	1.14	1.16	1.23	
4.50	415.0	515.4	0.149	197.	0.05	645.	639.	0.00181	1.21	1.08	1.11	1.24	
6.50	415.0	520.5	0.147	199.	0.05	651.	646.	0.00178	1.19	1.07	1.09	1.24	
8.50	415.0	525.6	0.146	201.	0.05	662.	656.	0.00171	1.14	1.02	1.05	1.25	
9.50	415.0	528.1	0.145	202.	0.05	662.	657.	0.00174	1.15	1.03	1.06	1.24	
10.50	415.0	530.6	0.145	203.	0.05	677.	671.	0.00159	1.06	0.96	0.98	1.26	
11.50	415.0	533.2	0.144	203.	0.05	685.	679.	0.00153	1.02	0.92	0.95	1.27	
13.50	415.0	538.3	0.142	205.	0.05	687.	681.	0.00156	1.04	0.94	0.97	1.27	
15.50	415.0	543.3	0.141	207.	0.05	693.	688.	0.00154	1.03	0.92	0.96	1.27	
17.50	415.0	548.3	0.140	209.	0.05	692.	686.	0.00162	1.07	0.96	1.00	1.25	
19.50	415.0	553.3	0.139	211.	0.05	695.	690.	0.00164	1.08	0.97	1.00	1.25	
21.50	415.0	558.4	0.137	213.	0.05	694.	689.	0.00171	1.12	1.00	1.05	1.23	

RUN	OMEGA	BIGQ	SMALLQ	DD	ID	ELT	TIN	VTEST	HEAT	BAL			
4	1159	0.041	12.60	0.3297	0.5272	0.5068	24.0	503.	29.50	0.05			
EL	PB	TB	ROB	VELOC	M	TO	TI	H	H/HF	H/HB	H/HSMPL	TW/TB	
2.50	240.0	512.4	0.087	336.	0.08	692.	684.	0.00192	1.33	1.20	1.22	1.33	
4.50	240.0	519.9	0.086	340.	0.08	707.	698.	0.00185	1.27	1.16	1.18	1.34	
6.50	240.0	527.4	0.085	345.	0.08	711.	705.	0.00186	1.28	1.16	1.18	1.34	
8.50	240.0	534.9	0.084	350.	0.08	735.	727.	0.00172	1.18	1.07	1.10	1.36	
9.50	240.0	538.7	0.083	353.	0.08	750.	742.	0.00162	1.12	1.02	1.05	1.38	
10.50	240.0	542.4	0.082	355.	0.08	764.	756.	0.00154	1.07	0.98	1.00	1.39	
11.50	240.0	546.1	0.082	358.	0.08	769.	761.	0.00154	1.06	0.97	1.00	1.39	
13.50	240.0	553.6	0.081	362.	0.08	772.	764.	0.00157	1.08	0.98	1.01	1.38	
15.50	240.0	561.0	0.080	367.	0.08	780.	772.	0.00156	1.07	0.98	1.01	1.38	
17.50	240.0	568.4	0.079	372.	0.08	779.	771.	0.00163	1.11	1.00	1.04	1.36	
19.50	240.0	575.8	0.078	377.	0.08	783.	775.	0.00165	1.12	1.01	1.06	1.35	
21.50	240.0	583.3	0.077	382.	0.08	788.	780.	0.00167	1.13	1.02	1.06	1.34	



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